Annual Report of the Board of Public Health Works, Province of Bombay

For the Year 1938-39

'39-40

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ANNUAL REPORT OF THE BOARD OF PUBLIC HEALTH WORKS, PROVINCE OF BOMBAY.

FOR THE YEAR ENDING 31ST MARCH 1939.

The Public Health Branch was re-organized on the 1st April 1933 and became purely consultant. In consequence, the functions, powers and constitution of the Board of Public Health Works in the Presidency were also reviewed.

2. The official and non-official membership of the Board was organised as under:—

(1) The Commissioner, Central Division.	PRESIDENT.
(2) The Secretary to Government, General Department.	MEMBERS.
(3) The Chief Engineer and Secretary to Government, Public Works Department.	
(4) The Director of Public Health for the Government of Bombay.	
(5) The Consulting Surveyor to Government.	
(6) and (7) Two non-officials.	
(8) The Consulting Public Health Engineer to Government.	MEMBER AND SECRETARY.

The personnel of the Board is given in Appendix I.

3. The functions and powers of the Board stand as under :—

Functions.

(1) The Board is to advise Government on all general questions of sanitary policy including the formulation of the principles to be followed for the healthy and orderly growth of inhabited

areas and the preparation and submission to Government of Public Health Engineering type designs. The Board will also be consulted by Government regarding large individual schemes of sanitary improvements.

(2) The Board is to report to Government upon such matters as may be referred to it by Government for opinion, but is free to represent to Government any matter which it recognises as of importance.

(3) The Board is to consider measures for effecting improvements in sanitation in the Province and to give help and advice to local bodies on public health matters.

(4) The Board is to scrutinise public health improvement schemes from all aspects including finance with a view to recommending execution by the local body concerned with or without help from Government.

4. *Powers of the Board.*

The Board is empowered to accord—

(1) Approval to the preliminary investigations of Sanitary schemes up to any amount.

(2) Approval to the preparation of detailed plans and estimates.

(3) Administrative approval to works costing not more than Rs. 50,000 in the case of projects which are proposed to be executed by the local body through the agency of the Government Public Works Department.

In the case of works proposed to be executed by the local body through its own agency, the Board shall be competent to give administrative approval without limit.

(4) Preliminary approval to sanitary schemes to be carried out from provincial revenues up to any amount.

(5) Sanction to non-recurring grants up to Rs. 10,000 in each case from such sums as may be placed at the disposal of the board by Government, for minor sanitary schemes from time to time.

All cases which are administratively approved by the Board are to be reported to Government with a brief description of the works and intimation concerning the agency which the local body proposes to employ to execute the work.

The Board discharges its functions at meetings held at intervals, any specially urgent questions being dealt with by circulation. The Board's executive functions are carried out by the Consulting Public Health Engineer to Government.

5. The duties of the Consulting Public Health Engineer are to examine the schemes technically, to investigate the details on site, to inspect works under execution and to advise local bodies in respect of their sanitary schemes. All public health schemes carried out from loan funds are scrutinised by the Consulting Public Health Engineer for the Board in respect of their technical details, and the schemes are administratively approved or recommended to Government for approval by the Board before construction is undertaken.

An application for raising a loan either from Government or in the open market in connection with a Public Health Scheme is entertained only after the scheme has been approved administratively and sanctioned technically by the competent authority concerned.

Note.—Schemes costing not more than Rs. 50,000 can be approved administratively by the Board of Public Health Works and sanctioned technically by the Consulting Public Health Engineer to Government. Those costing more than Rs. 50,000 require the administrative approval and the technical sanction of Government.

Public Health works financed from loans taken by local bodies are, if executed by their own qualified agency, subject to control and inspection by the Consulting Public Health Engineer to Government according to rules framed under the Local Authorities Loans Act. But where the local body does not either possess the requisite staff, or employ a qualified agency capable of carrying out the work on approved lines, it is open to Government to impose a condition that the work should be carried out by the agency of the Public Works Department.

6. The Public Health Engineering Branch was again re-organized from 1st December 1938. The Poona Water Works Division and the Government Central Store and Workshops were converted into sub-divisions and brought under the administrative control of one executive head "The Consulting Public Health Engineer to Government".

The Sub-Divisional Officer, Poona Water Works Sub-Division, has now charge of—

(1) The Poona Water Works Pumping Station.

(2) The Holkar's Bridge Pumping Station.

(3) Pashan dam and filters.

(4) Kirkee Water Works.

The Sub-Divisional Officer, Dapuri Sub-Division, has now charge of—

(1) Workshop manufacture at Dapuri.

(2) Training of apprentices.

(3) M. and R. of public works department surplus machinery.

(4) Inspection and repairs to Government road rollers in the Province.

The Consulting Public Health Engineer, in addition to his normal duties, exercises direct control over—

(1) Administration of all public health (water supply and drainage) works in the Poona area.

(2) Supervision and maintenance of the Government sewage pumping station near Bahiroba nala, Poona, and the rising main line as far as distributary No. 5 in Mutha Canal.

(3) Realization of share cost of capital advanced, interest and running costs from local bodies.

(4) Alandi Water Works.

(5) Ambernath and Badlapur Water Works.

(6) Matheran Water Works.

(7) Advising on mechanical questions and carrying out inspections and tests on pumping plants all over the Province.

(8) Boring works section situated in Ahmedabad and now working in Gujerat.

7. Only one meeting of the Board was held during the year under report, viz. on the 14th September 1938. The projects which came up for the Board's approval subsequently were dealt with by circulation.

The schemes that were finally approved by the Board are tabulated in Appendix II.

8. The Consulting Public Health Engineer himself or through his assistants, inspected all the public health works carried out by local bodies in the Province. A large amount of preliminary work by way of inspection and advice has to be carried out and rough costs of schemes given before a request actually emanates from a local body for the preparation of plans and estimates of any new project. The local bodies concerned are in many cases not able to give effect at once to the advice tendered as they have always to depend upon the state of their finances at the time. The volume of work initiated in the year under report as reflected by the permissions granted for the preparation of plans and estimates, and approvals accorded to projects by the Board, is therefore small, when compared to the preliminary work actually undertaken.

9. The following among other places were visited during the year and advice offered in respect of their public health works.

Ahmedabad.

With the rapid development of this important industrial centre, it becomes increasingly difficult to cope with the demand for water, especially in the hot weather. The 24" dia. porous pipe gallery installed some years back to collect more water tends to clog up and reduce the flow of water. The Municipality has been advised to lay another 30" dia. collecting main and to install collecting roses fixed on to C. I. tees on the main, to increase the area of infiltration and to exploit cones of depression of the subsoil. Water supply is also supplemented by putting down several borings, but as the bore water is unfortunately brackish it is mixed with river water when delivered alternately to the public. Other means of increasing the supply have also been suggested.

The second stage of the Ahmedabad Suburban Drainage scheme has been in full swing. One of the most vexatious problems at Ahmedabad is about the disposal of sewage and the pollution of the river Sabarmati. The effluent discharging into the river after treatment by land filtration is highly charged with bacteria and to effectively stop this discharge the Municipality has been advised to work out a scheme by which all this sewage effluent will be collected at various points on the bank of the river and electric pumps installed so as to lift this effluent and discharge it on to suitable land. By doing this, not only the pollution of the river will be stopped, but valuable crops can also be grown and the soil improved. The scheme worked out should embody the following:—

(*a*) The sewage should be made to pass through a continuous flow settling tank with the object of getting rid of most of the suspended solids and thinning out the sewage.

(*b*) The sewage will then be run on to land for downward filtration and the effluent pumped on to a farm.

Ahmedabad affords ample opportunity and good soil for such a scheme to become a great success.

Kapadwanj.

Infiltration works failed to give the required purification and yield. The gallery had been choked up. It was advisable as a tentative measure to give up using the infiltration gallery and resort to direct intake from the river and to chlorinate the supply.

A detailed scheme for filtration commencing from raw water intake to the present jack well to be converted into a raw water sump and other changes involved is required to be drawn up and such a scheme will be worked out and supplied to the Municipality, if desired.

Bandra.

The complete sewerage of the town is in progress. The total length of the sewers to be laid was about 68,000 feet run, of which about 35,000 feet have already been constructed. The common

disposal works for Bandra, Khar, Santa Cruz, Danda and Kurla are expected to be in full swing during the next financial year.

Kurla.

The sanctioned drainage scheme for Kurla has been in progress The scheme is being executed by the Executive Engineer, Thana Division. About half of the town is already sewered.

The Municipality is alive to the fact that the old town should also be sewered. They are submitting a complete project for this area shortly.

Ahmednagar.

The town is known to suffer long for want of an adequate and clean water supply. It has been brought home to the Municipality that their storage for water supply is at present adequate, but that they must introduce purification works to clean the water, as the present methods are faulty and result in the water being charged with chemicals. The Muncipality has paid the necessary centage charges for preparation of the filtration scheme and for a surface drainage disposal scheme. It is expected that the new schemes will be taken up for execution by the beginning of the next year.

Belapur.

Inspected the Belapur water supply proposals made by Messrs. Satbhai & Co. Suggestions for locating infiltration works, jack well, pumping station and elevated service reservoir were given. The scheme is feasible.

Kopargaon.

Inspected the water supply schemes proposed by Messrs. Satbhai & Co. The site proposed for infiltration works was approved. The distance from infiltration works to jack well will be over 1,000 feet. The connecting trench will be very deep, say 30 feet and in loose silt deposit. Dewatering below subsoil level will be very costly. Provision in the scheme for the purpose appears to be inadequate. Amended fair project is still awaited.

Jalgaon.

Progress of laying distribution mains was held up for want of specials, pipes, etc. The Engineer having resigned, there is no suitable responsible officer under the Chief Officer to carry on the work. Suggested installation of a chloronome in place of the dose given by manual labour.

Amalner.

The town planning area has developed to a considerable extent and the earthen sullage channels were observed to be overflowing. Unless measures were taken to deal with the sullage flows, the whole area would be rendered unfit for human habitation.

Parola.

Inspected the two sources of water supply with municipal councillors:—

(*1*) Infiltration works in the bed of the Bori river.

(*2*) Infiltration wells in the bed of Bhokarbari nala.

Either scheme is estimated to cost over Rs. 2 lakhs. The Municipality has no funds. If present taxation is increased, the scheme can be financed from loan to be raised in the open market. Advised the Municipality as to the procedure they should follow if the Municipality desire that the work should be taken up by Government Agency.

Dhulia.

Perchloron solution was made by churning; faults of their working were pointed out. Installation of a chloronome was suggested. Examination of reports of analysis show that contamination took place in the service mains after the water had left the service reservoir. How to detect the source of pollution was explained to the Municipal Health Officer.

Instructions were given to the Municipal Engineer for undertaking surveys and investigations for a possible site for a farm for disposal by irrigation of the sullage water.

Nasik.

The shortage of water in Nasik during the hot weather is very acute and is having a bad effect on the prospects of the town. Both the quantity and quality of water have to be improved to cope with the present demand. The Municipality has been advised to work up proposals to include the following works:—

(1) Impounding works for storing 126 million cubic feet of water at a new site.

(2) New site for electric pumping station just above the Anandwalli weir and installation of a new pumping machinery.

(3) A rising main, 21″ diameter from the Anandwalli weir to the new site of filters.

(4) Provision of coagulation tanks and rapid filters.

(5) 21″ diameter gravitation main from filters to existing reservoirs.

Malegaon.

The Municipality has drawn up proposal for water supply to 40,000 souls at 20 gallons per head per day, basing river Mosum as the source of supply. On inspection and enquiries, it appears doubtful if the Mosum will supply all requirements of Malegaon. The Municipality is therefore advised to sink trial pits for yield tests in the bed of the river to get a correct idea of the situation. Otherwise, the Municipality would do well to base their proposals on the river Girna, which is known to be perennial.

Yeola.

Inspected three probable sources of supply :—

(1) Site near Nagarsul.

(2) near Matulsthan, and

(3) near Wadgaon.

During investigations in the past, the results were not encouraging A reliable and practicable source of supply appears to be the Khirde Sathe Tank, but that presupposes that it would be reserved exclusively for domestic supply to Yeola and drawals for irrigation would be entirely stopped.

Junnar.

The Municipality have been advised to provide a vertical spindle pump to their pumping plant to facilitate easy working, to provide a separate reservoir to store up water from another source and to work up the plans and estimates for providing a roof over the existing reservoir and also for a surface drainage to the town.

Bhimashankar.

The jointing of the masonry of the tank on the north side was bad. Instructions were given personally to the District Local Board, Engineer to have the interstices between the rubble completely filled in with 4 : 2 : 1 cement concrete using small sized shingles. The sluice valve should be removed from its present position outside the tank and refixed inside the tank.

Satara.

A detailed inspection of the aqueduct supplying Satara town was made. It was pointed out that this duct, 16 miles long, is very leaky and it is suggested to treat the same either with a compound of Asphalt or else to lay hume pipes. The purification of the water is also faulty and the colour of the water brown. Certain suggestions for improvements in aluming arrangements were made.

The town's surface drainage was also inspected and it is hoped the Municipality will prepare a complete scheme and construct surface drains in stages and improve their general sanitation.

Karad.

Instructions were given on the methods to be adopted for purification of water. If a chloronome were installed, the ways in which it was to be worked were pointed out. Ventilators may be provided to the jack well as per design supplied.

Mahableshwar.

The urgent necessity for providing good water supply and efficient drainage was impressed on the Municipality. Mahableshwar should move with the times. By the provision of

a piped water supply Mahableshwar should attract more visitors and incidentally increase municipal revenue. As an instance, it was pointed out how Matheran had quadrupled the number of visitors since the installation of good water supply.

Inspected the Elphinstone tank and the Bishop's tank. They are reported to be leaky. Advised that the tanks should be emptied after the rains and the bottoms and sides should be re-plastered with 5 per cent. of pudlo.

The Morarji Castle spring was noticed to be overflowing to the extent of about 8,000 gallons a day. Suggestions for collecting the water of this spring and pumping it to a service reservoir, its chlorination and distribution to the bazar area and certain bungalows were given.

Suggestions were made for improving the drainage, provision of septic tank, installation of incinerator, etc., were given and design supplied.

Sholapur.

The Municipality have been advised to survey a fresh source to supplement the existing water supply from the Ekruk Tank. They have been advised to provide all pure water reservoirs with a roof to prevent existing outside pollution. The present purification of the water was found to be faulty and detailed advice was given to improve the quality of water.

Pandharpur.

The Municipality propose to remodel the distribution system. The project, estimated to cost Rs. 3 lakhs, approximately has been approved by the Board of Public Health Works. Funds are required to be raised in the open market with Government approval and the agency of execution decided.

It was necessary that ventilators should be provided to the jack well, so that a fresh supply of pure air may be discharged into the bottom of the jack well thrcugh one pipe and the foul air expelled through the other. This would avoid accidents to workmen. Type design for this sort of ventilator has been supplied to the Executive Engineer, Sholapur Division.

Belgaum.

The old 1918 scheme is on too vast a scale and is unlikely of achievement financially. It is possible to devise a smaller scheme amounting to less than Rs. 10 lakhs, and this would appeal to the Municipality and Government sanction to floating a loan obtained and the work executed.

Bijapur.

The Bhutnal storage reservoir was inspected. The raising of the waste weir is now under construction and is expected to be completed in a few weeks. The slow sand filtration was found to be faulty and outgrown its capacity. The Municipality have been advised to take out all sand and convert these filters into settling tanks for the use of alum treatment. The present water supply to the town is coloured and the dose of chlorine high. Detailed instructions were given to improve the quality of water.

Dharwar.

Water supply to this town is most inadequate. In years of late or deficient rains, there is no water supply for 3 to 12 weeks at a stretch and people have to obtain supplies from wells. The main requirement of Dharwar is to find another catchment area and a supplementary pumping plant so as to augment the existing supply.

Hubli.

The rate of water supply per head in Hubli is very meagre, viz. 9 gallons per head per day. There is ample water in the Unkal tank and it is possible to increase the rate of water supply to 30 gallons per head per day. This would involve re-designing the diameters of most of the supply pipes. Detailed instructions as to chlorination and alum treatment were given.

The old 1894 machinery may be dismantled and a new engine installed. If the electric company offers a reasonable rate, the electric pumps, which are cheapest in capital cost, should be considered.

Panvel.

The present water supply is only about 70,000 gallons per day, which supplies about 7·25 gallons per head for the existing population of 9,000 souls. The Municipality has formulated proposals for increasing the flow of water into the existing aqueduct by lengthening it and tapping more spring water. It is also proposed to increase the spring water level by constructing a masonry weir to be built in the river just above the present aqueduct. The Municipality has been asked to work up a comprehensive scheme on given lines.

Matheran.

The maintenance and repairs of this water works are under Government agency. Improvements in the method of chlorination by the addition of ammonium sulphate, which helps to neutralise the taste of chlorine were carried out.

Incinerator may be installed to burn the dry refuse.

Among other places inspected are :—

Karad,
Vita,
Nipani,
Saundatti Yellamma,
Mahad,
Rajapur,
Khed (Ratnagiri),
Karwar,
Sangamner,
Sirur,

etc., etc. Suitable advice to improve the existing water supply and drainage arrangements or to find suitable sources of supply was given to the officers concerned.

10. Fees are now levied by the Consulting Public Health Engineer—*vide* Appendix III. The total amount of such fees recovered during the year and credited to Government amounted to Rs. 19,105-4-0.

11. *Conclusion.*—The mechanical plant at most of the water works that have been inspected has on the whole not been quite efficient, but those plants run by Government agency are usually well maintained. Most distribution systems leave much to be desired. In many towns records have not been correctly maintained and in some conditions are chaotic. Extensions are usually carried out haphazardly and branch mains overloaded with numerous connections instead of duplicate mains being laid. The distribution systems in most of the large towns are out of date and require re-organization, e.g., Hubli. Waste has properly to be tackled and reduced, the relief would only be temporary and old conditions would resume after the expiration of a few years.

R. A. COLLETT,
Secretary, Board of Public Health Works.

APPENDIX I.

PERSONNEL OF THE BOARD OF PUBLIC HEALTH WORKS, PROVINCE OF BOMBAY, AS IT STOOD ON 31ST MARCH 1939.

President.

The Commissioner, Central Division.	Mr. J. W. Smyth, C.S.I., C.I.E., I.C.S.

Official Members.

The Secretary to Government, General Department.	Mr. V. S. Bhide, B.A., LL.B. (Cantab.), Bar-at-law, I.C.S.
The Chief Engineer and Secretary to Government, P. W. D.	Mr. C. E. Aitken, B.Sc. (Edin.), I.S.E.
The Director of Public Health for the Government of Bombay.	Lt.-Col. A. Y. Dabholkar, M.C., M.B.B.S., B.Sc. (Bom.), D.P.H., D.T.M. & H. (Lond.), I.M.S.
The Consulting Surveyor to Government.	Mr. G. B. Soparkar, L.C.E., F.S.I., A.M.T.P. Inst. (Lond.).

Non-Official Members.

Mr. Pestanshah N. Vakil.

Mr. B. B. Chakranarayan, M.L.A.

Official Member and Secretary.

Mr. R. A. Collett, M.Inst.C.E., M.R.San.I., M.Inst.W.E., Consulting Public Health Engineer to Government.

R. A. COLLETT,
Secretary, Board of Public Health Works.

APPENDIX II.

PUBLIC HEALTH ENGINEERING SCHEMES APPROVED BY THE BOARD OF PUBLIC HEALTH WORKS DURING THE YEAR 1938-39.

The following projects were approved and execution of the same authorized by the agency noted against each :—

Name of Project.	Estimated cost.	Agency of Execution.
	Rs.	
1. *Poona City Water Supply.*—Water supply scheme in the high level area in Town Planning Scheme No. 1.	1,00,000	Poona City Municipality.
2. *Dhulia Drainage.*—Laying of street drains in district Nos. 10 to 13.	15,858	Dhulia Municipality.
3. Surat Drainage	56,14,400	Surat Municipality.
4. Deviation Works in respect of the Joint treatment and disposal works for Bandra and Kurla.	2,27,500	Bandra Municipality.
5. Revised plans and estimates for Kurla drainage.	5,81,830	Executive Engineer, Thana Division.
6. *Pandharpur Water Supply*—Improvements to distribution system.	3,30,183	Not yet decided.
7. Pandharpur Drainage ...	3,23,250	Do.
8. Construction of a feeder channel from the Padugonda Tank to the Halbhavi Tank at Nargund.	9,212	Do.

R. A. COLLETT,

Secretary, Board of Public Health Works.

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APPENDIX III.

SCALE OF FEES IN RESPECT OF PREPARATION, SCRUTINY, EXECUTION AND INSPECTION OF PUBLIC HEALTH SCHEMES CARRIED OUT BY GOVERNMENT AGENCY.

(1) *For preliminary investigation and report.*—For a local body—no charge. For an outside body—the daily pay of theofficer making the investigation and the staff which accompanies him from the date of leaving headquarters till the date of return *plus* 50 per cent. for a period not exceeding seven days.

For periods in excess of seven days, the charge will be as above for the first seven days, and thereafter the daily pay of the officer making the investigation and staff which accompanies him *plus* 100 per cent.

In all cases the travelling and halting allowances of the Consulting Public Health Engineer and his staff will be paid by the local or outside body concerned.

(2) *For carrying out detailed surveys in connection with a project.*—The estimated cost of the survey, including cost of establishment to be engaged, shall be recovered.

(3) *For preparation of a project complete with all necessary drawings and estimates.*—2½ per cent. of the estimated cost less the amounts paid under (1) and (2) above.

(4) *For scrutiny by the Consulting Public Health Engineer of a project prepared for a local or outside body by an agency other than the Public Works Department.*—1¼ per cent. of the estimated cost of the project.

(5) *Inspection, by the Consulting Public Health Engineer to Government, of Public Health Works under construction, if constructed by an agency other than the Public Works Department.*—1¼ per cent. of the actual works outlay exclusive of land compensation of the project.

If the Consulting Public Health Engineer is asked to act continuously as consultant for any work and has accordingly to visit that work from time to time as it progresses, the total charge will be 1¼ per cent. of the estimated cost. If at the request of the local body he pays an occasional visit only the charge will be Rs. 100 *plus* the actual expenses of journey *plus* usual travelling allowances, etc.; but no charge is made for visits made by the Consulting Public Health Engineer on his own initiative or for advice offered on such visits or for visits by the Engineers of local bodies to him at his office to consult him about any particular point that arises.

(6) *Construction of works by the Public Works Department on behalf of a local body.*—Establishment and tools and plant charges at 15 per cent. of the estimated cost of the project inclusive of 2½ per cent. for the preparation of plans and estimates.

R. A. COLLETT,
Secretary,
Board of Public Health Works,
Province of Bombay.

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4.	The Director of Public Health for the Government of Bombay.	
5.	The Consulting Surveyor to Government.	
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8.	The Consulting Public Health Engineer to Government.	*Member and Secretary.*

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Functions.—

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(1) approval to the preliminary investigations of sanitary schemes up to any amount ;

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An application for raising a loan either from Government or in the open market in connection with a Public Health Scheme is sanctioned only after the scheme has been approved administratively and technically by the competent authority.

Note.—Schemes costing not more than Rs. 50,000 can be approved administratively by the Board of Public Health Works and technically by the Consulting Public Health Engineer to Government. Those costing more than Rs. 50,000 require the administrative approval and technical sanction of Government.

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on approved lines, it is open to Government to impose a condition that the work should be carried out by the agency of the Public Works Department.

6. Sind was separated from the Bombay Province from 1st April 1936 and constituted into a separate province. The activities of the Board of Public Health Works and the Consulting Public Health Engineer are therefore confined since that date to the Bombay Province.

7. Two meetings were held during the year, one on 30th June 1937 and the other on 14th March 1938. The projects which came up for the Board's approval subsequently were dealt with by circulation.

The schemes that were finally approved by the Board are tabulated in Appendix II.

The Consulting Public Health Engineer, himself or through his assistants, inspected all the public health works in the Province carried out by local bodies.

A large amount of preliminary work by way of inspection has to be carried out and advice given before a request actually emanates from a local body for the preparation of plans and estimates for any new project. The bodies concerned are in many cases not able to give effect at once to the advice tendered as they have always to depend upon the state of their finance at the time. Thus the volume of work initiated in a year as reflected in the permissions granted for the preparation of plans and estimates, is no measure of the total work of the division. Approval accorded to projects by the Board is only a small part of the total work.

8. The expenditure on public health works carried out by Government agency (Public Works Department staff) for local bodies amounted to Rs. 1,52,290 during the year, and that incurred from provincial funds for works maintained by Government amounted to Rs. 4,63,965 which together amounts to Rs. 6,16,255. The total Government grant-in-aid sanctioned to cover centage charges or rebates amounted to Rs., 37,395. The expenditure incurred during the year by local bodies in the Province on account of their public health works, amounted to Rs. 12,29,650.

Fees are now levied by the Consulting Public Health Engineer—*vide* Appendix III. The total amount of such fees recovered during the year and credited to Government amounted to Rs. 22,628.

9. Statistical information regarding the finances and technical working of the water-supply and drainage installations in this Province are included in the Report. The statements show, besides other useful information, the consumption of water in towns which have their own water works installations, the expenditure incurred on maintenance and the cost per 1,000 gallons of water supplied, taking into account the interest and sinking fund charges. It may be generally observed that information about all the water supply and drainage installations of the Province is not included,

The information supplied by the Municipalities has been checked to the extent possible before incorporation in the statements forming the appendices. The statistical data presented will be helpful to those interested in civic welfare and in the design of suitable schemes. The statistical information tables published as appendices to the report from 1936-37 are being appreciated by the local bodies. The next step will be to introduce comments by the sanitary experts on the working of the installations pointing out shortcomings, if any, as well as the general lines of requisite developments.

N. K. JOGLEKAR,
Consulting Public Health
Engineer to Government.

APPENDIX I.

PERSONNEL OF THE BOARD OF PUBLIC HEALTH WORKS, BOMBAY PROVINCE, AS IT STOOD ON 31ST MARCH 1938.

President.

The Commissioner, Central Division.	Mr. J. W. Smyth, C.S.I., C.I.E., I.C.S.

Official Members.

The Secretary to Government, General Department.	Mr. H. T. Sorley, I.C.S.
The Secretary to Government, Public Works Department.	Mr. N. B. Baxter, I.S.E.
The Director of Public Health for the Government of Bombay.	Lt.-Col. A. Y. Dabholkar, M.C., M.B.B.S., B.Sc. (Bom.), D.P.H., D.T.M & H., I.M.S.
The Consulting Surveyor to Government.	Mr. T. H. G. Stamper, M.C., F.S.I.

Non-Official Members.

1. Mr. Pestanshah N. Vakil.
2. Khan Bahadur Abdul Latif Haji Hajratkhan, M.L.A.

Official Member and Secretary.

Mr. W. H. E. Garrod, M.Inst.C.E., M.R.San.I., I.S.E.

N. K. JOGLEKAR,
Secretary, Board of Public Health Works.

APPENDIX II.

PUBLIC HEALTH ENGINEERING SCHEMES APPROVED BY THE BOARD OF PUBLIC HEALTH WORKS DURING 1937-38.

The following projects were approved and execution of the same authorised by the agency noted against each :—

	Name of Project.	Estimated cost.	Agency of execution
		Rs.	
1.	*Sholapur Drainage*— Laying of further portion of the collecting and gravitation outfall sewer.	1,95,871	Sholapur Municipality.
2.	*Sholapur Drainage*— Sadar Bazar Nala Sewer	81,756	Do.
3.	*Sholapur Drainage*— Internal main underground pipe drains.	1,65,900	Do.
4.	*Sholapur*— Diversion of the Sadar Bazar Nala at Sholapur.	54,512	Do.
5.	*Bijapur Water Supply*— Raising of the height of the dam of the Bhutnal reservoir.	76,165	Bijapur Municipality.
6.	*Improvements to Khed Water Supply*— Laying additional distribution mains.	9,915	Executive Engineer, Ratnagiri Division.
7.	*Gadag-Bettigeri Drainage—III Stage*...	2,47,134	Executive Engineer, Dharwar Division.
8.	*Sholapur Water Supply*— R. C. C. Reservoir (Revised project) ...	93,972	Sholapur Municipality.
9.	*Dhulia Water Supply*— Laying 4" rider mains on the Bombay-Agra Road and removing and relaying the existing 8" pipes.	21,000	Dhulia Municipality.
10.	*Sholapur Water Supply*— Distribution system to T. P. Scheme No. 2.	57,106	Sholapur Municipality.
11.	*Bandra Drainage*— Disposal Works	2,26,500	Bandra Municipality.

Since 1933 (when re-organization of the branch was effected), the Board has authorised preparation of detailed plans and estimates by Government agency in respect of 19 schemes ; out of these, five have been prepared by the Executive Engineers concerned and passed on after scrutiny by the Consulting Public Health Engineer and approval of the Board of Public Health Works to the authorities concerned. The remaining schemes were in course of preparation and their receipt was awaited.

Out of the 36 projects approved so far, 12 schemes have been completed ; and the work of the remaining 24 schemes was either in progress and was not commenced pending sanction to the raising of loans. The works in progress were duly inspected by the Consulting Public Health Engineer to Government.

N. K. JOGLEKAR,
Consulting Public Health
Engineer to Government.

APPENDIX III.

SCALE OF FEES IN RESPECT OF PREPARATION, SCRUTINY, EXECUTION AND INSPECTION OF PUBLIC HEALTH SCHEMES CARRIED OUT BY GOVERNMENT AGENCY.

(1) *For preliminary investigation and report.*—For a local body—no charge. For an outside body the daily pay of the officer making the investigation and the staff which accompanies him from the date of leaving headquarters till the date of return *plus* 50 per cent. for a period not exceeding seven days.

For periods in excess of seven days, the charge will be as above for the first seven days, and thereafter the daily pay of the officer making the investigation and staff which accompanies him *plus* 100 per cent.

In all cases the travelling and halting allowances of the Consulting Public Health Engineer and his staff will be paid by the local or outside body concerned.

(2) *For carrying out detailed surveys in connection with a project.*—The estimated cost of the survey, including cost of establishment to be engaged, shall be recovered.

(3) *For preparation of a project complete with all necessary drawings and estimates.*—2½ per cent. of the estimated cost less the amounts paid under (1) and (2) above.

(4) *For scrutiny by the Consulting Public Health Engineer of a project prepared for a local or outside body by an agency other than the Public Works Department.*—1¼ per cent. of the estimated cost of the project.

(5) *Inspection by the Consulting Public Health Engineer to Government of Public Health Works under construction, if constructed by an agency other than the Public Works Department.*—1¼ per cent. of the estimated cost of the project.

If the Consulting Public Health Engineer is asked to act continuously as consultant for any work and has accordingly to visit that work from time to time as it progresses, the total charge will be 1¼ per cent. of the estimated cost. If at the request of the local body he pays an occasional visit only the charge will be Rs. 100 *plus* the actual expenses of journey *plus* usual travelling allowances, etc.; but no charge is made for visits made by the Consulting Public Health Engineer on his own initiative or for advice offered on such visits or for visits by the engineers of local bodies to him at his office to consult him about any particular point that arises.

(6) *Construction of works by the Public Works Department on behalf of a local body.*—Establishment and tools and plant charges at 10 per cent. of the estimated cost of the project inclusive of 2½ per cent. for the preparation of plans and estimates.

N. K. JOGLEKAR,
Secretary,
Board of Public Health Works,
Bombay Province.

STATEMENT

Statement of operations of various Water Works

Particulars.	Ahmedabad.	Kapadwanj.	Surat.	Thana.	Kurla.
1	2	3	4	5	6
POPULATION.					
1. By census of 1931 in Municipality...	382,575	15,931	161,413	21,816	30,266
2. By census of 1931 in Cantonments.	.....	.....	.....	.....	.....
3. Inhabitants drawing supply from mains.	370,000	15,931	161,413	21,816	32,000
ANNUAL CONSUMPTION OF WATER.					
4. Metered supplies—in million gallons—					
(*a*) Cantonments	.....	.....	.....	.....	.....
(*b*) Trade	343	1·3	16·21	0·04	91·21
(*c*) Domestic (bungalows, etc.) ...	.....	0·35	.....	.....	97·24
(*d*) Buildings	.....	0·14	27·15	3·83	.....
(*e*) Municipal purposes (road watering, irrigation and flushing etc.).	.....	.....	.....	.....	12·12
Total metered supplies ...	343	1·79	43·36	3·87	200·57
Unmetered supplies—					
(*a*) Domestic (assessment or ferrule).	4,939	.....	.....	109·5	.....
(*b*) Standposts	30	.....	.....	0·007	.....
(*c*) Buildings	40	.....	.....	0·003	.....
(*d*) Municipal purposes (Road watering. irrigation and flushing, etc.).	360	.....	.....	5·16	1·28
Total unmetered supplies ...	5,369	77·09	1,288·45	114·67	1·28
Total quantity supplied during the year—million gallons.	5,712	78·88	1,331·81	118·54	201·85

No. 1.

in the Bombay Province for the year 1937-38.

Ahmednagar. 7	Jalgaon. 8	Dhulia. 9	Nandurbar. 10	Nasik. 11	Trimbak. 12	Poona City. 13	Poona Cantonment. 14
41,880	34,464	39,656	16,741	45,744	4,195	168,103	16,676
.....	.....	.....	.....	.....	.....	.....	35,807
43,680	34,464	38,276	16,741	50,003	4,195	160,000	53,183
.....	.....	.....	.....	.....	.....	.....	.....
.....	4·54	.....	4·9	0·90	.....	.....	.....
.....	3·77	.....	.....	54·63	.....	.....	966·85
.....	0·13	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	8·44	2·8	4·9	55·53	.....	.....	966·85
.....	410·19	.....	.....	.....	.....	.....	26·84
.....	.....	.....	87·77	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	2·59	.....	.....	.....	.....	.....	.....
260·97	412·78	143·2	87·77	282·12	.....	.....	26·84
260·97	421·22	146·0	92·67	337·66	.....	.....	993·69

STATEMENT

Statement of operations of various Water Works

Particulars.	Kirkee.	Lonavla.	Alandi.	Karad.	Satara Camp.
1	15	16	17	18	19
POPULATION.					
1. By census of 1931 in Municipality..	.....	10,693	1,684	14,479	.....
2. By census of 1931 in Cantonments.	13,062	.....	.....	.....	2,352
3. Inhabitants drawing supply from mains.	13,062	10,693	1,684	14,500	2,300
ANNUAL CONSUMPTION OF WATER.					
4. Metered supplies—in million gallons—					
(a) Cantonments	.....	.....	.....	.....	0·04
(b) Trade	.....	.....	.....	.....	.....
(c) Domestic (bungalows, etc.) ...	202·315	9·99	.....	.....	8·29
(d) Buildings	37·95	0·17	.....	.....	.....
(e) Municipal purposes (Road watering, irrigation and flushing etc.).	...	.....	... ..	.....	.....
Total metered supplies ...	240·27	10·16	.....	.....	8·33
5. Unmetered supplies—					
(a) Domestic (assessment or ferrule).	0·80	.....	... ...	.....	8·51
(b) Standpost	.....	.....	.....	.....	.....
(c) Buildings	.....	.....	.....	.....	.....
(d) Municipal purposes (Road watering, irrigation and flushing, etc.)	.....	.....	.....	73·76	.....
Total unmetered supplies ...	0·80	51·15	7·86	73·76	8·51
6. Total quantity supplied during the year million— gallons	241·07	61·31	7·86	73·76	16·84

No. 1—*contd.*

in the Bombay Province for the year 1937-38—contd.

Sholapur.	Barsi.	Pandharpur.	Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.
20	21	22	23	24	25	26	27
135,574	27,610	27,508	39,747	83,494	2,734	17,857	19,321
.....	.....	.....	.....	.....	.....	.....	2,500
135,574	27,610	30,000	32,486	83,494	2,734	17,857	8,500
.....	.....	.....	4·25	.....	.....	.....	.....
7·69	4·18	.....	2·83	.....	.....	.....	.....
40·44	0·06	.....	.....	.....	.....	.....	.....
.....	.....	.....	7·32	.....	.....	.....	.....
.....	.....	282·02	.....	.....	.....	.....	.....
48·13	4·24	282·02	14·40	.....	.....	.....	.....
.....	150·64	.....	.....	.....	.....	35·93	.....
.....	36·70	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	2·75	.....	.....	.....	.....	0·07	.....
1,477·50	190·09	.....	.....	296·04	.....	36·00	57·37
1,525·63	194·33	282·02	203·86	296·04	.....	36·00	57·37

STATEMENT

Particulars.	Ahmedabad.	Kapadwanj.	Surat.	Thana.	Karla.
1	2	3	4	5	6
7. Daily average supply—million gallons.	15·65	0·21	3·64	0·3	0·55
8. Maximum daily average in any one month—million gallons.	16·59	0·28	4·14	0·32	0·57
9. Maximum supply on any one day during year—million gallons.	22·34	0·35	4·82	.....	7·8
10. Consumption per head per day for trade alone—million gallons.	3	0·22	.....	0·007	1·2
11. Consumption per head per day for municipal purposes and buildings—gallons.	3	.....	.....	0·98	.....
12. Consumption per head per day for domestic purposes—million gallons.	37	13·0	.....	13·58	17·2
13. Total consumption per head per day (items 10, 11 and 12).	43	13·22	22·6	14·567	18·4
14. Hours of daily supply	18·05	11	17	21	24
15. Total hours of pumping during the year.	20,309·75	40·63	6,753	.....	.....
LIFT OF PUMPS (in feet.)					
16. From river to settling tanks, feet...	.....	146	.....	.....	.....
17. From filtered water pumps to town distribution, system feet.	.....	.....	.....	.....	.....
18. Total lift, (items 16 and 17) feet ...	110	146	113·84	.....	.....
19. Total w. h. p. hours during the year—million gallons.	3·23	0·59	45·94	.....	.....
SUPPLY CONNECTIONS.					
Unmetered—					
20. Number of connections made during year.	631	117	579	34	.....
21. Total number of connections in town.	38,361	517	14,110	1,178	.....
Metered—					
22. Number of connections made during year.	.....	3	74	.....	18
23. Total number of connections in town.	.....	8	333	2	1,024
24. Number of trade connections made during year.	11	2	35	1	.....
25. Total number of trade connections.	132	5	132	2	.....
26. Total number of metered connections (items 23 and 25).	143	13	472	4	1,024
ANNUAL CHARGES AND COST OF WATER SUPPLIED.					
27. Maintenance charges Rs.	2,79,565	12,688	70,737	3,516	4,567
28. Interest and sinking fund charges. Rs.	89,703	4,000	.....	22,758	1,732
29. Total charges ... ... Rs.	3,69,268	16,688	70,737	26,274	6,299

No. 1—*contd.*

Ahmednagar.	Jalgaon.	Dhulia.	Nandurbar.	Nasik.	Trimbak.	Poona City.	Poona Cantonment.
7	8	9	10	11	12	13	14
0·75	1·15	0·4	0·25	0·92	.....	.....	2·72
0·99	1·23	0·4	0·30	1·03	.....	.....	3·23
0·99	1·23	0·4	0·39	1·70	.....	.....	.....
.....	0·36	.....	0·8	0·005	.....	.....	.....
.....	0·44	.....	.....	.....	.....	.....	.....
17·07	32·60	10·0	14·1	18·4	.....	.....	51
17·07	33·40	10·0	14·9	18·405	.....	.....	51
6	5	10	4	4	.....	.....	24
.....	8,013	.....	1,920	7,962	.....	.....	4,179
.....	186	.....	50	.....	.....	.....	40
.....	.....	.....	90	200	.....	.....	170
.....	186	.....	90 & 50	200	.....	.....	75 to 80 118 to 210
.....	0·39	.....	.....	2·8	.....	.....	0·60
66	100	47	108	138	.....	.....	19
1,690	1,341	1,499	638	1,954	.....	.....	841
.....	.....	.....	.....	17	.....	.....	72
.....	17	.....	.....	256	.....	.....	2,600
.....	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	9	2	.....	.....	.....
.....	18	.....	9	258	.....	.....	2,600
8,212	27,410	7,035	5,375	38,245	.....	.....	1,66,424
51,000	3,283	.....	24,000	8,674	.....	.....	1,75,671
59,212	30,696	7,035	29,375	46,919	.....	.....	3,42,095

STATEMENT

Particulars.	Kirkee.	Lonavla.	Alandi.	Karad.	Satara Camp.
1	15	16	17	18	19
7. Daily average supply—million gallons.	0·66	0·17	0·003	0·20	0·05
8. Maximum daily average in any one month—million gallons.	0·80	0·34	0·04	0·21	0·05
9. Maximum supply on any one day during year—million gallons.	.....	0·35	0·14	0·28	.....
10. Consumption per head per day for trade alone — million gallons.	.....	.....	.....	.....	.....
11. Consumption per head per day for municipal purposes—million gallons.	.....	.....	.....	.....	.....
12. Consumption per head per day for domestic purposes—million gallons.	50	15	.....	14·0	20·0
13. Total consumption per head per day (items 10, 11 and 12).	50	15	15	14·0	20·0
14. Hours of daily supply	24	24 & 8	24	5	23
15. Total hours of pumping during the year.	3,077	.....	1,053	3,194	.....
LIFT OF PUMPS (in feet.)					
16. From river to settling tanks, feet.	.....	.....	90·0	75·0	.....
17. From filtered water pumps to town distribution, system feet.	170	.....	.....	70·0	.....
18. Total lift, (items 16 and 17) feet ...	170	.....	90	145·0	.....
19. Total w. h. p. hours during the year—million gallons.	0·175	.....	0·003	0·054	.....
SUPPLY CONNECTIONS.					
Unmetered—					
20. Number of connections made during year.	1	13	.....	21	.....
21. Total number of connections in town.	43	582	.....	606	52
Metered—					
22. Number of connections made during year.	21	1	.....	.....	1
23. Total number of connections in town.	820	80	.....	.....	86
24. Number of trade connections made during year.	.....	.....	.....	.....	.....
25. Total number of trade connections.	.....	.....	.....	.....	.....
26. Total number of metered connections (items 23 and 25).	820	80	.....	.....	86
ANNUAL CHARGES AND COST OF WATER SUPPLIED.					
27. Maintenance charges Rs.	63,890	2,990	5,454	9,000	5,000
28. Interest and sinking fund charges. Rs.	78,718	1,637	1,308	8,669	.....
29. Total charges ... ... Rs.	1,42,608	4,622	6,762	17,669	5,000

No. 1—*contd.*

Sholapur.	Barsi.	Pandharpur.	Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.
20	21	22	23	24	25	26	27
4·17	0·53	0·77	0·57	0·81	.....	0·10	0·28
4·34	0·57	1·06	0·6	0·87	.....	0·12	0·21
4·60	.....	1·63	0·6	.....	.....	.....	.....
0.15	0·41	.....	.....	.....	.....	5·5	.....
30	0·21	.....	.....	.....	.....	.....	.....
.....	18·64	.....	.....	.....	.....	.....	.....
30·15	19·27	25·76	17·07	10	.....	5·5	18·42
8	6·5	6·5	5	15	.....	12	24
16,740	.....	4,922	8,621	5,503·5	.....	.....	.....
.....	.....	137	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
145	.....	137	221	139	.....	.....	.....
1·11	.....	0·20	0·002	0·21	.....	.....	.....
274	58	.....	18	70	.....	34	3
4,418	1,145	.....	920	1,563	.....	653	281
.....	.....	.....	10	.....	.....	.....	.....
24	1	.....	112	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	19	.....	.....	.....	.....	.....	.....
24	20	.....	112	.....	.....	.....	.....
1,77,116	13,504	17,439	33,210	53,768	.....	5,607	3,198
24,154	17,292	37,877	19,284	2,939 6,962	.....	.....	6,319
2,01,270	30,796	55,312	52,494	63,669	.....	5,607	9,517

STATEMENT

1		Ahmedabad. 2	Kapadwanj. 3	Surat. 4	Thana. 5	Kurla. 6
30. Cost per 1,000 gls. per 100 ft. lift.	As.	1·0	2·33	0·48	.....	.....
31. Cost per 1,000 gls. maintenance charges.	As.	0·80	3·33	0·55	3·35	0·31
32. Cost per 1,000 gls. interest and sinking fund.	As.	0·20	.....	.....	0·25	0·12
33. Total charges per 1,000 gls. (items 31 and 32).		1·00	.....	0·55	3·58	0·43
ANNUAL INCOME FROM WATER WORKS.						
34. Unmetered—						
(a) Water rate ...	Rs.	.....	18,324	2,10,911	33,746	.....
(b) Ferrule rating ...	Rs.	12,74,055	52	.....	.....	.....
(c) Buildings and other receipts.	Rs.	.....	4,287	11,081	.....	.....
Total ...		12,74,055	22,663	2,21,992	33,746	.....
(d) Municipal purposes—						
(i) Drain flushing ...	Rs.	.....	.....	.....	.....	.....
(ii) Road watering ...	Rs.	.....	.....	6,000	.....	.....
(iii) Parks and other public purposes.	Rs.	.....	.....	.....	.....	.....
(iv) Buildings ...	Rs.	.....	.....	.....	.....	.....
(v) Charitable institutions, schools, etc., free or at reduced rates.	Rs.	.....	.....	.....	.....	.....
Total (for municipal purposes) ...		.....	.....	6,000	.....	.....
Total for unmetered ...		.....	22,664	2,21,992	.....	.....
35. Metered—						
(a) Sale of water by meter	Rs.	1,71,671	886	22,454	2,233	1,32,055
(b) Meter rent ...	Rs.	5	50	.....	.....	1,420
(c) Municipal purposes ...	Rs.	.....	.....	.....	.....	.....
Total for metered ...		1,71,676	936	22,454	2,233	1,33,475
36. Total income (items 34 and 35)	Rs.	14,45,731	23,600	2,44,446	35,979	1,33,475
INCOME AND WORKING CHARGES.						
37. Receipts per 1,000 gls. supplied through meter.	As.	8	·33	8·0	9·25	10·5
38. Receipts per 1,000 gls. supplied through assessment rating.	As.	4	.....	3·0	4·0	.....
39. Receipts per 1,000 gls. supplied on total consumption.	As.	4·3	4·75	5·5	13·5	10·4
40. Profit or loss per 1,000 gls.	As.	3·3	.....	4·9	.....	0·26
41. Profit or loss on years working ...		10,76,463	6,912	1,73,709	9,705	3,321
42. Capital expenditure from revenue.		221	16,883	.....	2,603	.....
43. Net profit or loss		854	6,911	1,96,803	864	3,321

No. 1—*contd.*

Ahmednagar.	Jalgaon.	Dhulia.	Nandurbar.	Nasik.	Trimbak.	Poona City.	Poona Contonment.
7	8	9	10	11	12	13	14
.....	0·4	.....	5·00	0·18	.....	.....	.....
.....	0·92	9·4	0·91	0·9	.....	.....	2·68
.....	.....	.....	4·00	0·2	.....	.....	2·83
.....	0·92	9·4	4·91	1·1	.....	.....	5·51
50,623	55,000	25,302	13,322	40,307	.....	.....	13,420
.....	.....	.....	13,642	.....	.....	.....	.....
.....	693	867	.....	693	.....	.....	.....
50,623	55,698	26,169	26,964	41,000	.....	.....	13,420
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	5,560	.....	.....	.....
50,623	55,698	.....	.....	46,560	.....	.....	13,420
.....	6,986	1,519	2,120	23,355	.....	.....	4,15,889
.....	.....	.....	.....	2,075	.....	.....	21,048
.....	.....	.....	.....	.....	.....	.....	.....
.....	6,986	1,519	2,120	24,430	.....	.....	4,36,937
50,623	62,684	27,688	29,084	70,990	.....	.....	4,50,357
.....	2·68	8·64	7·0	7·0	.....	.....	8·0
.....	2·17	2·88	4·83	2·6	.....	.....	.....
.....	2·39	3·04	5·0	3·0	.....	.....	7·25
.....	1·34	2·28	.....	1·0	.....	.....	1·74
8,589	31,988	20,653	−291	24,071	.....	.....	1,08,262
.....	.....	.....	5,966	6,997	.....	.....	.....
.....	4,578	.....	6,257	29,335	.....	.....	1,08,262

STATEME NT

			Kirkee.	Lonavla.	Alandi.	Karad.	Satara Camp.
	1		15	16	17	18	19
30.	Cost per 1,000 gls. per 100 ft. lift.	As.	.....	.....	15·20	2·643	.....
31.	Cost per 1,000 gls. maintenance charges.	As.	4·24	0·75	11·10	1·95	4·75
32.	Cost per 1,000 gls. interest and sinking fund.	As.	5·22	0·33	2·60	1·87	.....
33.	Total charges per 1,000 (items 31 and 32).	gls.	9·46	1·08	13·7	3·82	4·75
	ANNUAL INCOME FROM WATER WORKS.						
34.	Unmetered—						
	(a) Water rate ...		400	12,611	.....	7,087	955
	(b) Ferrule rating ...	Rs.	.....	.....	.....	14,949	.....
	(c) Buildings and other receipts.	Rs.	.....	.....	.....	305	.....
	Total ...		400	12,611	.....	22,291	955
	(d) Municipal purposes—						
	(i) Drain flushing ...	Rs.	.....	.....	.....	.....	.....
	(ii) Road watering ...	Rs.	.....	.....	.....	.....	.....
	(iii) Parks and other public purposes.	Rs.	.....	.....	.....	.....	.....
	(iv) Buildings ...	Rs.	.....	.....	.....	.....	.....
	(v) Charitable institutions, schools, etc., free or at reduced rates.	Rs.	.....	.....	.....	.....	84
	Total (for municipal purposes) ...		.....	.....	.....	.....	84
	Total for unmetered ...		400	12,611	.....	22,292	1,039
35.	Metered—						
	(a) Sale of water by meter	Rs.	1,27,453	7,603	.....	.....	5,305
	(b) Meter rent ...	Rs.	.....	492	.....	.....	360
	(c) Municipal purposes ...	Rs.	.....	.....	.....	.....	.....
	Total for metered ...		1,27,453	8,095	.....	.....	5,665
36.	Total income (items 34 and 35)	Rs.	1,27,853	20,706	.....	22,292	6,704
	INCOME AND WORKING CHARGES.						
37.	Receipts per 1,000 gls. supplied through meter.	As.	8·0	.....	.....	5·16	11·4
38.	Receipts per 1,000 gls. supplied through assessment rating.	As.	.....	.....	.....	.....	2·0
39.	Receipts per 1,000 gls. supplied on total consumption.	As.	8·48	.....	.....	.....	6·5
40.	Profit or loss per 1,000 gls.	As.	0·96	.....	.....	1·34	1·75
41.	Profit or loss on years working ...		−14,755	16,084	.....	4,628	1,704
42.	Capital expenditure from revenue.		.....	.....	.....	.....	83,417
43.	Net profit or loss ...		14,755 (loss)	16,084	.....	6,898	.....

No. 1—*concld.*

Sholapur. 20	Barsi. 21	Pandharpur. 22	Bijapur. 23	Hubli. 24	Matheran. 25	Nipani. 26	Ratnagiri. 27
1·28	.....	1·78	0·013	2·47	.....	.....	.....
1·45	1·1	1·00	2·5	(2·90	.....	2·49	0·68
0·17	.....	2·14	1·5	0·63	.....	.....	1·76
1·62	1·1	3·14	4·00	3·43	.....	2·49	2·44
1,55,008	26,413	.....	.....	83,751	.....	9,968	5,065
1,00,756	.....	.....	24,000	.....	.....	.....	.....
1,747	.....	.....	.....	349	.....	.....	37
2,57,511	26,413	.....	24,000	84,145	.....	9,968	5,102
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	3,000
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	650	.....	.....	.....	.....
.....	.....	.....	650	.....	.....	.....	3,000
2,57,511	.....	.....	.....	.....	.....	9,968	8,102
23,637	2,547	46,433	8,050	.....	.....	.....	.....
.....	.....	.....	300	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
22,637	.....	.....	8,350	.....	.....	.....	.....
2,80,148	28,961	46,433	31,547	84,145	.....	9,968	8,102
7·5	10	9·5	8·0	.....	.....	.....	.....
1·1	2·6	.....	2·0	.....	.....	.....	2·26
2·9	12·6	2·64	2·5	4·54	.....	4·43	2·26
7·6	.....	1·28 (loss)	4·5	1·64	.....	1·94	0·18 (loss)
78,878	−1,885	−3,879	.....	30,876	.....	4,351	1,415
39,472	.....	.....	.....	5,016	.....	917	.....
78,878	−1,885	−3,879	.....	25,360	.....	3,444	1,415

N. K. JOGLEKAR,

Consulting Public Health Engineer to Government.

BP Bk P 9—2*a*

STATEMENT No. 2.

Statement showing total demand, amount recovered, remissions and arrears of various water works in the Bombay Province during the year 1937-38.

Name of Water Works.	Total Demand.	Total amount recovered.	Total amount of remissions.	Arrears on 31st March 1938.		Remarks.
				Total amount.	Percentage on total demand.	
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.		
1. Ahmedabad...	21,73,805	14,45,731	1,45,701	5,82,373	26	
2. Kapadwanj ...	27,232	23,600	1,373	2,259	8	
3. Surat ...	2,74,426	2,44,446	5,518	24,462	9	
4. Thana ...	52,974	35,979	4,913	12,082	22·8	
5. Kurla ...	1,48,451	1,33,475	3,845	11,131	7·4	
6. Ahmednagar .	54,938	50,623	103	4,212	7·6	
7. Jalgaon ...	77,516	62,684	1,234	13,598	17·5	
8. Dhulia ...	39,484	27,668	1,251	10,545	26·7	
9. Nandurbar ...	49,196	29,084	22	20,090	40·8	
10. Nasik ...	1,02,125	70,990	2,689	28,446	27·8	
11. Trimbak ...	.....	.....	.....	.....	.....	
12. Poona City ...	.....	.....	.....	.....	.....	
13. Poona Cantonment.	4,50,357	4,50,357	.....	.....	.....	
14. Kirkee ...	1,27,853	1,27,853	.....	.....	.....	
15. Lonavla ...	27,028	20,706	2,121	4,201	15·5	
16. Alandi ...	.....	.....	.....	.....	.....	
17. Karad ...	37,884	22,292	374	15,218	40·1	
18. Satara Camp .	6,742	6,704	.....	38	·56	
19. Sholapur ...	3,03,838	2,80,148	7,702	15,983	5·2	
20. Barsi ...	40,403	28,961	1,568	9,874	24·4	
21. Pandharpur...	46,433	46,433	.....	.....	.....	
22. Bijapur ...	34,712	31,547	.....	3,165	9·1	
23. Hubli ...	1,05,345	84,145	.....	21,200	20·1	
24. Matheran ...	.....	.....	.....	.....	.....	
25. Nipani ...	11,773	9,968	.....	1,805	15·3	
26. Ratnagiri ...	9,656	8,102	.....	1,554	16	
Total ...	42,02,166	32,41,516	1,78,414	7,82,236	18·6	

N. K. JOGLEKAR,
Consulting Public Health Engineer to Government.

STATEMENT No. 3.

Statement showing number and size of all connections; also number and size of unmetered and metered connections for the year 1937-38.

STATEMENT

Statement showing number and size of all connections; also number

Name of Water Works.	Size of				
	⅜"	½"	¾"	1"	1½"
Unmetered supplies.					
1. Ahmedabad ...	...	38,629	202	50	...
2. Kapadwanj ...	...	517	...	...	...
3. Surat ...	...	13,980	125	5	...
4. Thana ...	...	1,178	...	...	...
5. Kurla ...	...	...	...	...	...
6. Ahmednagar ...	...	1,592	76	22	...
7. Jalgaon ...	...	1,225	75	41	...
8. Dhulia ...	...	1,433	61	3	2
9. Nandurbar ...	...	623	12	3	...
10. Nasik ...	...	1,954	...	...	...
11. Trimbak ...	...	...	...	...	...
12. Poona City ...	...	...	...	...	...
13. Poona Cantonment ...	765	76	...	...	...
14. Kirkee ...	40	3	...	...	...
15. Lonavla ...	...	484	98	...	...
16. Alandi ...	...	...	...	...	...
17. Karad ...	...	606	...	...	...
18. Satara Camp ...	...	52	...	...	...
18A. Satara City ...	...	1,252	3	1	...
19. Sholapur ...	...	4,221	197	...	...
20. Barsi ...	...	1,087	58	...	...
21. Pandharpur ...	...	...	...	...	...
22. Bijapur ...	...	920	...	...	...
23. Hubli ...	...	1,240	...	278	...
24. Matheran ...	...	...	...	...	...
25. Nipani ...	...	629	...	11	13
26. Ratnagiri ...	...	262	9	5	5
Total ...	805	71,963	916	419	20

No. 3.

and size of unmetered and metered connections for the year 1937-38.

connections.						Total No.	Remarks.
2"	3"	4"	6"	8"	12"		
...	...	...	...	...	...	38,881	
...	...	...	...	...	...	517	
...	...	...	...	...	...	14,110	
...	...	...	...	...	...	1,178	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	1,690	
...	...	1	...	...	...	1,341	
...	...	...	...	...	...	1,499	
...	...	...	...	...	...	638	
...	...	...	...	...	...	1,954	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	841	
...	...	...	...	...	...	43	
...	...	...	...	...	...	582	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	606	
...	...	...	...	...	...	52	
...	...	...	...	...	...	1,256	
...	...	...	...	...	...	4,418	
...	...	...	...	...	...	1,145	
...	...	...	...	...	...	... ..	
...	...	...	...	...	...	920	
...	45	...	...	...	...	1,563	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	653	
...	...	...	...	...	...	281	
...	45	...	...	...	...	74,168	

STATEMENT

Name of Water Works.	Size of				
	$\frac{3}{8}$"	$\frac{1}{2}$"	$\frac{3}{4}$"	1"	$1\frac{1}{2}$"
Metered supplies.					
1. Ahmedabad ...	...	56	6	23	4
2. Kapadwanj ...	...	13	...	...	...
3. Surat ...	...	425	35	5	2
4. Thana ...	...	4	...	...	...
5. Kurla ...	...	907	105	6	4
6. Ahmednagar ...	...	...	...	...	...
7. Jalgaon ...	...	9	3	5	...
8. Dhulia ...	...	...	...	...	...
9. Nandurbar ...	...	4	2	3	...
10. Nasik ...	...	163	58	35	...
11. Trimbak ...	...	...	...	...	...
12. Poona City ...	...	...	...	...	...
13. Poona Cantonment ...	...	2,600	...	...	...
14. Kirkee ...	46	545	124	48	24
15. Lonavla ...	...	3	35	42	...
16. Alandi ...	...	...	...	...	...
17. Karad ...	...	...	...	...	...
18. Satara Camp ...	...	86	...	...	...
19. Sholapur ...	...	4	3	10	...
20. Barsi ...	...	7	4	4	2
21. Pandharpur ...	...	...	...	...	...
22. Bijapur ...	...	105	...	7	...
23. Hubli ...	...	...	...	...	...
24. Matheran ...	...	...	...	...	...
25. Nipani ...	...	...	...	...	...
26. Ratnagiri ...	...	...	...	...	...
Total ...	46	4,931	375	188	36

No. 3—*concld.*

connections.						Total No.	Remarks.
2″	3″	4″	6″	8″	12″		
21	4	28	1	...	...	143	
...	...	...	...	...	...	13	
3	1 of $2\frac{1}{2}$″ 1 of 3″	...	...	...	...	472	
...	...	...	...	...	...	4	
1	1	...	...	...	...	1,024	
...	...	...	...	...	...	.....	
...	...	1	...	...	...	18	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	9	
1	1	...	...	...	...	253	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	2,600	
14	14	3	2	...	...	820	
...	...	...	...	...	...	80	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	86	
2	5	...	...	...	...	24	
2	1	...	...	...	...	20	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	112	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	.....	
...	...	...	...	...	...	.....	
44	28	32	3	...	...	5,683	

N. K. JOGLEKAR,
Consulting Public Health Engineer to Government.

STATEMENT

Annual Maintenance Accounts of Water Works.

Particulars.	Ahmedabad.	Kapadwanj.	Surat.
	Rs.	Rs.	Rs.
I. *Establishment—*			
(*a*) Engineers	7,900		5,318
(*b*) Mechanics and drivers ..	16,720		2,304
(*c*) Workshops	1,776		.....
(*d*) Clerical staff	696	5,640	780
(*e*) Menial staff	492		3,786
(*f*) Office contingencies	2,318		.....
(*g*) Rent	.....		.....
(*h*) Cost of collecting water revenue, taxes and services rendered by other Departments.	50,481	700	24,000
	Chloronome staff. 557		
II. *Supplies—*			
(*a*) Fuel	1,354	2,020	26,036
(*b*) Power supply	94,334	.....	.....
(*c*) Lubricants	606	701	999
(*d*) Waste		75	197
(*e*) Packing	1,534	141	367
(*f*) Stores			1,589
III. *Repairs and maintenance—*	5,869		
(*a*) River training	11,279		.....
(*b*) Channels and wells	16,590		.....
(*c*) Settling tanks	.....	320	.....
(*d*) Filter beds	.....		.....
(*e*) Purchase of sand	.....		.....
(*f*) Aluminia ferric compound ...	.....		.....
(*g*) Chlorinating chemicals ...	.....	407	2,421
(*h*) Distribution system and fittings...	51,276	.....	500

No. 4.

in the Bombay Province during 1937-38.

Thana.	Kurla.	Ahmednagar.	Jalgaon.	Dhulia.	Nandurbar.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
.....	3,693		660	.....	1,260
.....	.....		686	1,894	2,008
.....	.....		.....	.....	.....
.....	.....	3,250	1,628	600	243
.....	.....		147	825	.....
.....	.....		60	.....	.....
.....	.....		.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....		.....	.....	398
.....	.....		23,310	.....	.....
.....	.....	2,308	336	.....	165
.....	.....		225	.....	16
.....	.....		.....	.....	.....
.....	397		100	.....	66
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	723
.....	.....	.....	.....	.....	57
.....	.....	.....	.....	58	.....
.....	.....	.....	.....	.....	.....
11	.....	.....	.....	.....	40
108	.....	1,429	.....	792	204
3,307	11	.....	.....	1,165	138

STATEMENT

Particulars.	Nasik.	Trimbak.	Poona City.
	Rs.	Rs.	Rs.
I. *Establishment*—			
(*a*) Engineers	7,990	.....	.....
(*b*) Mechanics and drivers ...		.....	.....
(*c*) Workshops		.....	.....
(*d*) Clerical staff	720	.....	.....
(*e*) Menial staff	3,142	.....	.....
(*f*) Office contingencies	.....	.....	.....
(*g*) Rent	.....	.....	.....
(*h*) Cost of collecting water revenue, taxes and services rendered by other Departments.	.....	.....	.....
II. *Supplies*—			
(*a*) Fuel	15,098	.....	.....
(*b*) Power supply	.....	.....	.....
(*c*) Lubricants	265	.....	.....
(*d*) Waste	1,929	.....	.....
(*e*) Packing		.....	.....
(*f*) Stores		.....	.....
III. *Repairs and maintenance*—			
(*a*) River training	2,669	.....	.....
(*b*) Channels and wells	94	.....	.....
(*c*) Settling tanks	.....	.....	.....
(*d*) Filter beds	.....	.....	.....
(*e*) Purchase of sand	.....	.....	.....
(*f*) Aluminia ferric compound ...	.....	.....	.....
(*g*) Chlorinating chemics... ...	1,133	.....	.....
(*h*) Distribution system and fittings...	260	.....	.....
(*i*) Standposts and hydrants ...	512	.....	.....
(*j*) Meters	1,087	.....	.....

No. 4—*contd.*

Poona Cantonment.	Kirkee.	Lonavla.	Alandi.	Karad.	Satara Camp.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
5,184	2,370	.....	780	1,454	.....
7,120	2,664	.....	696	468	348
16,169	4,616	.....	66	.....	.....
.....	.....	.....	.....	264	276
.....	.....	.....	216	1,048	140
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
28,289	4,604	.....	193	1,251	.....
674	.....	.....	.....	.....	.....
1,494	938	75	132	412	.....
5,320	1,330		111	73	.....
.....	.....			51	.....
1,148	100			387	.....
.....	.....	.....	.....	317	.....
.....	.....	.....	.....	39	.....
3,347	3,756	.....	.....	25	20
3,637	4,703	.....	1,722	746	200
.....	.....	.....	.....	187	275
3,170	1,875	.....	.....	140	25
8,023	3,146	.....	44	100	30
10,528	10,901	2,486	.....	.....	365
1,612	1,200	26	.....	.....	.....
8,300	4,497	403	.....	.....	75

STATEMENT

Particulars.	Sholapur.	Barsi.	Pandharpur.
	Rs.	Rs.	Rs.
I. *Establishment*—			
(*a*) Engineers	5,400		2,656
(*b*) Mechanics and drivers ...	1,152		2,063
(*c*) Workshops	3,276		408
(*d*) Clerical staff	2,064	499	696
(*e*) Menial staff	600		876
(*f*) Office contingencies	489		.....
(*g*) Rent	.....		204
(*h*) Cost of collecting water revenue, taxes and services rendered by other Departments.	10,289	1,695	.....
II. *Supplies*—			
(*a*) Fuel	35,819		3,485
(*b*) Power supply	.....		.....
(*c*) Lubricants	3,066		1,225
(*d*) Waste	437	193	275
(*e*) Packing	.....		50
(*f*) Stores	672		960
III. *Repairs and maintenance*—			
(*a*) River training	.....	.....	200
(*b*) Channels and wells	.....	.....	180
(*c*) Settling tanks	.....	.....	.....
(*d*) Filter beds	.....	.....	.....
(*e*) Purchase of sand	.....	.....	100
(*f*) Aluminia ferric compound ...	36,291	.....	.....
(*g*) Chlorinating chemicals ...	5,786	267	728
(*h*) Distribution system and fittings ...	15,258	222	.....
(*i*) Standposts or hydrants ...	.....	440	.....
(*j*) Meters	.....	.....	.....

No. 4—*contd.*

Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.	Remarks.
Rs.	Rs.	Rs.	Rs.	Rs.	
2,410	1,900	.....	480	.....	
.....	370	.....	1,842	432	
.....	.....	.....	.....	360	
629	.....	.....	240	.....	
2,666	2,118	.....	.....	.....	
620	56	.....	.....	.....	
16	.....	.....	.....	.....	
1,385	7,553	.....	480	768	
15,488	14,519	.....	1,630	.....	
.....	.....	.....	.....	.....	
1,341	364	.....	372	.....	
150	91	.....	208	.....	
511	120	.....		.....	
419	365	.....		205	
.....	.....	.....	.....	.....	
.....	133	.....	.....	225	
45	95	.....	.....	195	
3	25	.....	.....	.....	
75	.....	.....	.....	.....	
.....	869	.....	.....	.....	
2,476	.....	.....	.....	100	
682	16,675	.....	.....	376	
1,182	3,367	.....	.....	.....	
345	.....	.....	.....	40	

STATEMENT

Particulars.	Ahmedabad.	Kapadwanj.	Surat.
	Rs.	Rs.	Rs.
III. *Repairs and maintenance*—contd.			
(*i*) Standposts or hydrants ...	5,589		267
(*j*) Meters	.....		.....
(*k*) Buildings...	.....	2,684	.....
(*l*) Machinery	.....		.....
(*m*) Tools and plant	2,256		.....
IV. *Other charges*—			
(*a*) Water analysis	6,628	.....	.....
(*b*) Canal Departmental dues ...	.....	.....	.....
(*c*) Miscellaneous	500	.....	2,233
Total maintenance. (Items I, II, III and IV).	2,79,565	12,688	70,737
V. Repayment of loan charges (with interest).	89,703	4,000	.....
VI. Credit to municipal electric supply for power.	.....	.....	.....
Total charges. (Items I to VI)...	3,69,268	16,688	70,737

*Purchase of water from other Administrations—

No. 4—*contd.*

Thana.	Kurla.	Ahmednagar.	Jalgaon.	Dhulia.	Nandurbar.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
.....	82	1,225	.....	.....	.....
.....	384	.....	.....	202	.....
.....	.....	.....	.....	327	.....
.....	.....	.....	200	.....	.....
.....	.....	.....	.....	.....	.....
90	.....	.....	.....	40	36
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	21
3,516	4,567	8,212	27,410	7,035	5,375
22,758*	1,732	51,000	3,286	.....	24,000
.....	.....	.....	.....	.....	.....
26,274	6,299	59,212	30,696	7,035	29,375

Bombay Municipality and Railway.

STATEMENT

Particulars.	Nasik.	Trimbak.	Poona City.
	Rs.	Rs.	Rs.
III. *Repairs and maintenance*—contd.			
(*k*) Buildings	103	.....	.....
(*l*) Machinery		.....	.....
(*m*) Tools and plant		... ..	.....
IV. *Other charges*—			
(*a*) Water analysis ...	899	... .	.....
(*b*) Canal Department dues ...	.....	.....	.....
(*c*) Miscellaneous	2,303	.....	.....
Total maintenance. (Items I, II, III and IV).	38,245	.....	.....
V. Repayment of loan charges (with interest).	8,674	... ..	.....
VI. Credit to municipal electric supply for power.	... ..	.....	.....
Total charges. (Items I to VI) ...	46,919	.....	.....

No. 4—*contd.*

Poona Cantonment.	Kirkee.	Lonavla.	Alandi.	Karad.	Satara Camp.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1,337	330	.....	.....	410	.....
6,109	5,537	.....	.....	1,384	.....
.....	.....	.....	.....	.....	.....
4,921	3,937	.....	300	244	101
46,809	3,921	.....	.....	.....	3,094
3,233	3,467	.....	1,194	.....	51
1,66,424	63,890	2,990	5,454	9,000	5,000
1,75,671	78,718	1,632	1,308	8,669	.....
.....	.....	.....	.....	.....	.....
3,42,095	1,42,608	4,622	6,762	17,669	5,000

STATEMENT

Particulars.	Sholapur.	Barsi.	Pandharpur.
	Rs.	Rs.	Rs.
III. *Repairs and maintenance*—contd.			
(*k*) Buildings	835	.....	1,189
(*l*) Machinery	.....	.....	759
(*m*) Tools and plant	.....	8,808	110
IV. *Other charges*—			
(*a*) Water analysis	.....	1,821	700
(*b*) Canal Department dues ...	.....	.....	.....
(*c*) Miscellaneous	55,682	59	471
Total maintenance. (Items I, II, III and IV).	1,77,116	13,504	17,435
V. Repayment of loan charges (with interest).	24,154	17,292	37,877
VI. Credit to municipal electric supply for power.	.....	.....	.....
Total charges. (Items I to VI)...	2,01,270	30,796	55,312

No. 4—*concld.*

Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.	Remarks.
Rs.	Rs.	Rs.	Rs.	Rs.	
127	1,942	.....	.....	57	
1,360		.....	355	.....	
.....		.....	.....	45	
.....	8	.....	.....	300	
.....	.....	.....	.....	.....	
1,281	.....	.....	.....	95	
33,210	53,768	.....	5,607	3,198	
19,284	9,901	.....	.....	6,319	
.....	.....	.....	.....	.....	
52,494	63,669	.....	5,607	9,517	

N. K. JOGLEKAR,

Consulting Public Health Engineer to Government.

STATEMENT No. 5.

Statement showing costs, initial and of subsequent extensions and improvements chargeable to Capital.

1937-38.

No.	Water Works Installations.	Initial Capital cost.	Cost of subsequent extensions.	Expenditure during the year.	Total.
1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
1	Ahmedabad ...	22,00,000	26,32,297	2,21,285	50,53,582
2	Kapadwanj ...	4,79,384	.....	8,052	4,87,436
3	Surat ...	9,88,319	2,91,470	.....	12,79,789
4	Thana ...	.....	.....	2,603	2,603
5	Kurla ...	1,08,000	5,000	.....	1,13,000
6	Ahmednagar ...	18,63,785	.....	1,599	18,65,384
7	Jalgaon ...	4,08,564	19,324	1,25,549	5,53,437
8	Dhulia ...	5,01,558	.....	2,815	5,04,373
9	Nandurbar ..	3,75,051	4,979	11,623	3,91,653
10	Nasik ...	5,50,000	1,87,832	6,927	7,44,759
11	Trimbak ...	.....	.....	.....	.....
12	Poona City ...	.....	.....	.....	.....
13	Poona Cantonment ...	6,90,000	7,51,957	36,914	14,78,871
14	Kirkee ...	4,00,000	4,00,442	.....	8,00,442
15	Lonavla ...	4,93,414	33,407	546	5,27,367
16	Alandi ..	86,253	.....	.....	86,253
17	Karad ...	2,44,000	11,000	.....	2,55,000
18	Satara Camp ...	83,417	.....	.....	83,417
19	Sholapur ..	22,55,451	.....	39,472	22,94,923
20	Barsi ...	5,51,421	.....	.....	5,51,421
21	Pandharpur ...	4,30,871	2,48,107	.....	6,78,978
22	Bijapur ...	6,22,060	.....	44,222	6,66,282
23	Hubli ...	5,01,924	10,18,248	5,016	15,25,188
24	Matheran ...	.....	.....	.....	.....
25	Nipani ...	7,000	1,114	917	9,031
26	Ratnagiri ...	1,07,827	.....	2,430	1,10,257
	Total ...	1,39,48,299	56,05,177	5,09,970	2,00,63,446

N. K. JOGLEKAR,

Consulting Public Health Engineer to Government.

STATEMENT No. 6.

Details of pumps, filters, tanks, reservoirs, mains and other details of Water Works in the Bombay Province for 1937-38.

STATEMENT

Details of pumps, filters, tanks, reservoirs, mains and other

Particulars.	Ahmedabad.	Kapadwanj.	Surat.
1. Floor levels—			
Unfiltered Station ... R. L.	.....	.....	.....
Filtered Station ... R. L.	.....	23·00	118·00
2. Highest water level during the year. R. L.	.....	.....	.....
3. Lowest water level during the year. R. L.	.....	66·00	.....
4. Particulars of plant—			
Unfiltered Station ...	3 Plants—D. F. & G. Hathorn Davy's Triple Expansion Surface condensing vertical inverted type with Corless valves. 1 Horizontal Triple expansion side by side Tendem Surface condensing Worthington type.	.....	.....
Filtered Station ...	5 H. L. pumps with motors (vertical drive) sets. H.P. 300 (2) and 190 (3). 2 Low Lift vertical pumping sets for V. G. Tanks H.P. 150 each (Siemen's make). 3 Boosters electrical drive horizontal pumping sets H.P. 125 (1) and 75 (2) Crompton Parkison maker.	A duplicate set of Campbell Cold Starting Horizontal Crude Oil Engines of 37 B.H.P. and two deep well Worthington Plunger Pumps.	Two sets of Engines and Pumps. Engines-High Pressure Triple Expansion Vertical Worthington Steam Pumping Engines. 2 Boilers—Babcock and Wilcox type.
5. Capacity of Pumps—			
Unfiltered Station ... G. P. M.	.....	.....	.....
Filtered Station ... G. P. M.	D=210,000 E=360,000 F=210,000 G=210,000 *Electrical Plant—* 1=300,000 2=300,000 3=200,000 4 & 5=200,000 each. 6 & 7=200,000 each.	330	5,832

No. 6.

details of Water Works in the Bombay Province for 1937-38.

Bhiwandi.	Kurla.	Ahmednagar.	Jalgaon.	Dhulia.	Nandurbar.
.....	.....	.....	.....	.....	Not supplied
.....	.....	..... H. F. L. in tank. 2,254·10	624·03	1,108·32 1,135·42	....
.....	.....	L. W. L. in tank. 2,243·82	.....	1,125·15	.....
...	.....	.....	.....	.....	.....
.....	.....	.....	Two Asea Centrifugal motor pumps each of 120 B.H.P. and 3,000 volts High Tension, and one Asea 2 K. V. A. Transformer Ruston 100 B.P.H. oil engine as stand by.	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	833	.....	.....

STATEMENT

Particulars.	Nasik.	Trimbak.	Poona City.
1. Floor levels—			
Unfiltered Station ... R. L.	.....	.....	.....
Filtered Station ... R. L.	1,813·00	...	.....
2. Highest water level during the year. R. L.	1,844·00	.....	.....
3. Lowest water level during the year. R. L.	1,813·00	.....	.....
4. Particulars of plant—			
Unfiltered Station ..	.....	.....	.....
Filtered Station ...	Triple Expansion Surface Condensing Engines Nos. 2934 and 2935. Worthington Pumps 2 Nos. Babcock and Wilcox Boilers two.	.....	.....
5. Capacity of Pump—			
Unfiltered Station ... G. P. M.	.....	.....	.....
Filtered Station ... G. P. M.	796·3	.....	.....

No. 6—*contd.*

Poona Cantonment.	Kirkee.	Lonavla.	Alandi.	Karad.	Satara City.
1,875·00	.....	.....	1953 (Engine House).	.....	.....
1,877·49	1,804·06	.....	.....	.....	.....
1,876·49	.....	2,273·83	1,940·00	112·39	.....
1,876·40	.....	2,248·50	Not supplied ...	72·39	.....
2 W. Sisson Engines each capable of delivering 3,000 G.P.M. against 40 ft. head. 2 B. and Morcom Engines with Worthington Pumps. Capacity 4,500 G.P.M. against 40 ft. head.	By gravity from Pashan from Mutha Right Bank Canal.	.....	Two numbers of National O. H. 12 H. P. and Mather and platt Medivane 3'×4' vertical spindle.	Filtered and unfiltered combined triple single acting plunger pumps two with two oil engines.	.....
.....	.....	.....	.....	.....	.....
3 Worthington Engines and Pumps.	2 sets of Ruston Oil Engines with Centrifugal Pumps.	.....	.....	.....	.....
3,000	.....	.....	175	420	...
1,200 1,200 2,080	1,050 1,050	.....	.....	400	.....

STATEMENT

Particulars.	Sholapur.	Barsi.	Pandharpur.	Bijapur.
1. Floor levels—				
Unfiltered Station... R. L.	1,488·00	.....	.....	.....
Filtered Station ... R. L.	1,485·50 Settled water P. S. floor level.	.....	162·96 Engine house. 119·06 Pump floor.	1,822·00
2. Highest water level during the year. R. L.	.....	.....	146·50	1,844·00
3. Lowest water level during the year. R. L.	.....	.....	104·00	1,837·75
4. Particulars of plant—				
Unfiltered Station ...	2 Engines of Ruston and Hornsby Cold Starting 150 B.H.P. each with Mather and Platt two stage Centrifugal Pumps.	.....	Two sets of pumps Worthington single acting vertical triplex 14½" × 15' driven by two Ruston Cold Starting Oil Engines 84 and 78 B.H.P.	.....
Filtered Station ...	.....	.....	.....	Two sets of engines and pumps working side by side. Tandem fashion triple expansion surface condensing engines with horizontal plunger pumps double acting. Two Babcock water tube boilers with super heater and economiser.
5. Capacity of Pump—				
Unfiltered Station G.P.M.	1,500	.....	1,000	.....
Filtered Station ...G.P.M.	.....	.....	.....	500

No. 6—*contd.*

Hubli.	Matheran.	Nipani.	Ratnagiri.	Thana.
.....	.....	.....	.....	.....
2,033·50	.....	2,040·30 2,055·30	.....	.....
2,071·29	.....	2,055·00	406·00	.....
2,063·32	.....	2,048·00	392·00	.....
.....	.....	.....	.....	.....
Worthington Triple expansion engines with Worthington duplicate double acting pumps.	.....	Two Gonties Pyramid Pumps of 3'.	.....	.....
.....	210	.....	.....	.....
605	.....	62·5	.....	.....

STATEMENT

Particulars.	Ahmedabad.	Kapadwanj.	Surat.
6. Number of—			
(a) Rising Mains ...	One ...	One ...	One ...
(b) Leading Mains ...	Two ...	One ...	One ...
(c) Distribution Mains ...	Two ...	.....	.....
7. Length and Size of—			
	Length. Size.	Length. Size.	Length. Size.
(a) Rising Mains ...	450' 36'	6,360' 9	400' 22'
(b) Leading mains ...	6,500— 42' and 27'	... ...	5,700— 36' to 7'
(c) Distribution Mains ...	5 miles 36" to 27"	... ...	...
8. Number of Settling tanks ...	.....	.....	.....
9. Size of Settling tanks ...	.....	.....	.....
10. Capacity of settling tanks, gallons.	.....	.....	.....
11. Number of—			
(a) Slow sand filters ...	.....	.....	.....
(b) Mechanical filters ...	.....	.....	.....
(c) Rapid filters ...	.....	.....	.....
12. Size of—			
(a) Slow sand filters ...	.....	.....	.....
(b) Mechanical filters ...	.....	.....	.....
(c) Rapid filters ...	.....	.....	.....

No. 6—*contd.*

Bhiwandi.	Kurla.	Ahmednagar.	Jalgaon.	Dhulia.
.....	.....	.....	One ...	.....
.....	One ...	Three ...	One ...	One ...
.....	Six ...	Six ...	Six ...	.....
Not supplied ...	Length. Size.	Length. Size.	Length. Size. 12,405' 12'	Length. Size. ....
.....	0 24'	919' 12' 702' 10' 549' 8'	7,272' 15'	32,040' 8'
.....	754' 2' 19,336' 3' 11,816' 4' 7,181' 6' 1,496' 3' 1,364' 9'	817' 12' 693' 10' 546' 8' 2,650' 8' 8,666' 6' 32,031' 4'	3,450' 15' 892' 13' 3,751' 12' 590' 10' 733' 9' 2,493' 8' 1,089' 6' 635' 4'	.....
... ...	.....	.....	.....	One ...
.....	.....	.....	.....	14' × 14' × 8'
.....	.....	.....	.....	9,800
.....	.....	.....	.....	Four ...
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	80' × 40'
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

STATEMENT

Particulars.	Nandurbar.	Nasik.	Trimbak.	Poona City.
6. Number of—				
(a) Rising Mains ...	.....	One ...	.....	.....
(b) Leading Mains ...	.....	Four ...	.....	.....
(c) Distribution Mains...	.....	Six ...	.....	.....
7. Length and Size of—	Length. Size.	Length. Size.	Length. Size.	
(a) Rising Mains ...	.....	6,600' 12"	250' 8"	.....
(b) Leading mains ...	8,955' 12" 4,500' 10" 6,073' 8"	.....	.....	.....
(c) Distribution Mains...	.....	2,300' 7" 3,600' 6" 5,100' 5" 12,200' 4" 53,850' 3" 2,900' 2"	.....	.....
8. Number of Settling tanks	.....	.....	.....	.....
9. Size of Settling tanks ...	.....	.....	.....	.....
10. Capacity of settling tanks, gallons.	.....	.....	.....	.....
11. Number of—				
(a) Slow sand filters ...	.....	.....	.....	.....
(b) Mechanical filters ...	.....	.....	.....	.....
(c) Rapid filters ...	.....	.....	.....	.....
12. Size of—				
(a) Slow and filters ...	.....	.....	.....	.....
(b) Mechanical filters ...	.....	.....	.....	.....
(c) Rapid filters ...	.....	.....	.....	.....

No. 6—*contd.*

Poona Cantonment.	Kirkee.	Lonavla.	Alandi.	Karad.
Two ...	One ...	.....	One ...	One ...
Five ...	Five ...	One ...	.....	.....
Four ...	Three ...	Three ...	Three ...	Five ...
Length. Size.	Length. Size.	Length. Size.	Length. Size.	Length. Size.
1,090' 18' 4,645' 15' 4,512' 12'	4,850' 12'	.....	1,350' 9' 1,890' 6' 1,990' 4'	1,800' 8'
3,030' 21' 5,350' 18' 9,112' 15' 8,403' 12' 58,412' 9'	130' 18' 24,400' 15' 16,060' 12' 15,420' 10' 22,250' 9'	348' 12' 11,013' 6' in one length.	.....	.....
41,060' 6' 2,110' 5' 42,595' 4' 77,275' 3'	15,420' 6' 7,400' 4' 32,060' 3'	5', 4', 3' ...	900' 4' 325' 3' 3,929' 2'	420' 8' 1,140' 6' 870' 5' 3,190' 4' 13,000' 3'
Five ...	One ...	.....	.....	One in two compartments.
183' × 89' × 12' ...	125' × 50' × 20' ...	.....	.....	54·5' × 30' × 9' ...
5,800,000 ...	430·000 ...	.....	.....	175,000 ...
Nil ...	4 at Pashan ...	.....	.....	4 ...
.....	.....	.....	.....	.....
12 units ...	4 units (at H.B. W.W.).	.....	.....	.....
.....	4 × 108' × 51' ...	.....	.....	40' × 26' × 8' ...
.....	.....	.....	.....	.....
10 of 18' × 10' 1 of 30' × 21' ...	3 of 18' × 10' ... 1 of 15' × 12' ...	.....	.....	.....

STATEMENT

Particular.	Satara City.	Sholapur.	Barsi.	Pandharpur.
6. Number of—				
(a) Rising Mains ...	.....	One ...	.....	One ...
(b) Leading Mains ...	.....	Two ...	One ...	.....
(c) Distribution Mains ...	.....	.....	Seven ...	.....
7. Length and Size of—		Length. Size.	Length. Size.	
(a) Rising Mains ...	.....	11,000' 24"	.....	5,550'-15" ...
(b) Leading mains ...	.....	5,822' 33" 7,166' 30" Gravitation main from Ekruk Tank to Settling tank.	58,200' 10"	.....
(c) Distribution Mains ...	.....	2,700' 30" 3,700' 24" 5,218' 21" 1,710' 18" 13,163' 15" 25,370' 12" 1,130' 10" 3,291' 9" 3,000' 8" 41,828' 4"	2,420' 12" 2,335' 9" 1,440' 8" 5,000' 6" 8,048' 5" 6,503' 4" 6,855' 3"	.....
8. Number of Settling tanks ...	Three ...	Two ...	.....	.....
9. Size of Settling tanks ...	72'×24'×9·5' ...	148'×72'×10 Combined. ...	.....	.....
10. Capacity of settling tanks, gallons.	102,600 ...	1,300,000 ...	.....	.....
11. Number of—				
(a) Slow sand filters ...	.....	.....	.....	.....
(b) Mechanical filters ...	.....	.....	.....	.....
(c) Rapid filters ...	.....	.....	.....	.....
12. Size of—				
(a) Slow sand filters ...	.....	.....	.....	.....
(c) Mechanical filters ...	.....	.....	.....	.....
(b) Rapid filters ...	.....	.....	.....	.....

No. 6—*contd.*

Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.	Thana.
One ...	Two ...	.....	One ...	.....	.....
One ...	.....	.....	Two ...	One ...	.....
.....	.....	.....	Five ...	Four ...	.....
Length. Size.			Length. Size.	Length. Size.	
21,000' 16"	H.S.R. 13,460'-15' L.S.R. 7,920'-12'	.....	10,000' 4"	.....	.....
3,040' (14", 12", 10")	H.S.R. 2,550'-12' 3,406'-8"	.....	1,200' 6" 4,600' 3"	12,967' 9"	.....
3,531' 6" 4,663' 5" 5,281' 4" 34 046' 3" 6,666' 2"	About 11 miles 3' to 10'.	.....	17,515 2" 4,830' 1½" 740' 1"	1,010' 6" 4 540' 4" 4,413' 3" 9,461' 2"	.....
One ...	Two ...	.....	.....	.....	.....
10'×10'×8' ...	60·5'×22·5'×15·5' ...	.....	.....	.....	.....
5,000 ...	241,936 ...	.....	.....	.....	.....
4	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	Jewel Rapid filters.	.....	.....	.....	.....
70'×50' each ...	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	15' dia. ...	.....	.....	.....	.....

STATEMENT.

Particulars.	Ahmedabad.	Kapadvanj.	Surat.
13. Total capacity of mechanical filters per day.	.....	.....	.....
14. Number of clear water reservoirs.	One, Two compartments ...	.....	.....
15. Size of water (clear) reservoirs.	112' × 90' × 16'	.....	.....
16. Capacity of clear water reservoirs, gallons.	3,000,000	.....	.....
17. Number of service reservoirs ...	Three	Elevated S. R. One.	.....
18. Size of service reservoirs ...	(1) 60' dia. × 18' (2) 42' dia. × 18' (3) 120' × 120' × 12' ...	36' dia. × 18' ...	.....
19. Overflow from bottom of tanks.	17'-6" and 11'-6" ...	Top ...	.....
20. Capacity of service reservoirs, gallons.	1,485,000 ...	100,000 ...	.....
21. Number of Public standposts :—			
One tap—			
(a) Cast iron spouts ...	50	.....	56
(b) W. N. Cocks ...	60	2	6
(c) Bibcocks	20	.....	.....
(d) Pushcocks	100	.....	50
(e) Other types... ...	.....	.....	19
Two taps—			
(a) Cast iron spouts ...	.....	.....	.....
(b) W. N. Cocks ...	50	6	12
(c) Bibcocks	.....	.....	.....
(d) Pushcocks	40	.....	26
(e) Other types ...	.....	.....	.....

No. 6—*contd.*

Bhiwandi.	Kurla.	Ahmednagar.	Jalgaon.	Dhulia.
.....	.....	.....	.....	.....
.....	.....	.....	.....	One ...
.....	.....	.....	.....	22' × 5' × 10' ...
.....	.....	.....	.....	6,875 ...
.....	.....	One in two compartments.	One in two compartments.	One in two ...
.....	.....	70' × 70' × 10' ...	72·6' × 59·4' × 10' ...	56·5' × 119' × 10' ...
.....	.....	.....	.....	.....
.....	.....	612,500 ...	538,040 ...	800,000 ...
.....	.....	.....	.....	.....
.....	7	.....	.....	.....
.....	6	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	3	20	146
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	2	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	46	150	48

STATEMENT

Particulars.	Nandurbar.	Nasik.	Trimbak.	Poona City.
13. Total capacity of mechanical filters per day.	.....	.....	.....	.....
14. Number of clear water reservoirs.	.....	.....	.....	.....
15. Size of water (clear) reservoirs.	.....	.....	.....	.....
16. Capacity of clear water reservoirs, gallons.	.....	.....	.....	.....
17. Number of service reservoirs.	1 in 3 compartments.	Three ...	.....	.....
18. Size of service reservoirs.	59+44÷2×38×10... 12+24÷2×60×10	(1) 102'×48'×20' (2) 108'×44'×10' (3) 25'×25'×8'	.....	.....
19. Overflow from bottom of tanks.	Top ...	.....	.....	.....
20. Capacity of service reservoirs, gallons.	125,000 ...	(1) 500,000 ... (2) 300,000 (3) 30,000	.....	.....
21. Number of Public standposts :—				
One tap—				
(a) Cast iron spouts.	.....	.....	.....	.....
(b) W. N. Cocks ...	.....	.....	.....	.....
(c) Bibcocks ...	.....	.....	.....	.....
(d) Pushcocks ...	.....	26	.....	.....
(e) Other types ...	.....	.....	.....	.....
Two taps—				
(a) Cast iron spouts.	.....	.....	.....	.....
(b) W. N. Cocks ...	.....	.....	.....	.....
(c) Bibcocks ...	57	.....	.....	.....
(d) Pushcocks ...	.....	111	.....	.....
(e) Other types ...	.....	.....	.....	.....

No. 6—*contd.*

Poona Cantonment.	Kirkee.	Lonavla.	Alandi.	Karad.
...	.....	.....	.....	.....
Two ...	One ...	.....	.....	1 ...
280' × 98' × 8' ...	70' × 45' × 4' ...	.....	.....	71·5' × 50' × 6·5' ...
1,000,000 ...	80,000 ...	.....	.....	140,000 ...
Five ...	One ...	Four ...	7	1 in 2 compartments.
100' × 10'; 88' × 10' circular 50' × 8' 36' × 165' " in 2 " compartments; 32' × 10' circular.	60' × 60' × 12' Elevated Steel.	(2) 35·5' × 25' × 8' ... (2) 25' × 12·5' × 8' 21·5' × 21·5' × 5' (2) 27' × 26' × 8'	.....	63' × 31' × 7·5' ...
.....	.....	.....	... ...	Top.
989,112 80,221 224,562 100,000 50,000	270,000 ...	1 of 11,000; ... 1 of 100,000; 1 of 6,000; 1 of 33,000.	1 of 20,000 ... 3 of 10,000 1 of 13,000 2 of 16,000	90,000 ...
.....	.....	.....	.....	.....
.....	.....	29	.....	78
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	5	.....	8
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

STATEMENT

Particulars.	Satara City.	Sholapur.	Barsi.	Pandharpur.
13. Total capacity of mechanical filters pay day.	.....	.....	.....	.....
14. Number of clear water reservoirs.	.....	Four ...	.....	.....
15. Size of water (clear) reservoirs.	.....	.....	.....	.....
16. Capacity of clear water reservoirs, gallons.	.....	(1) 1,800,000 ... (2) 75,000 (3) 200,000 (4) 550,000	.....	.....
17. Number of service reservoirs.	1 in 2 compartments.	Four ...	1 in 2 compartments.	3 ...
18. Size of service reservoirs ...	70' × 35' × 10'	(1) 162' × 82' × 20' (2) 36' dia. × 12' (3) 57' × 57' × 10' (4) L.S. 95' dia. × 12'	82' × 70' × 11'	106' × 102' × 9' 2 of 106' × 52' × 9'
19. Overflow from bottom of tanks.	.....	.....	.....	.....
20. Capacity of service reservoirs, gallons.	150,000 ...	(1) 1,800,000 ... (2) 75,000 (3) 200,000 (4) 550,000	400,000 ...	.....
21. Number of Public standposts:—				
One tap—				
(a) Cast iron spouts ...	.....	.....	.....	.....
(b) W. N. Cocks ...	90	.....	1	.....
(c) Bibcocks ...	.....	.....	82	.....
(d) Pushcocks ...	4	261	1	.....
(e) Other types ...	28	.....	.....	.....
Two taps—				
(a) Cast iron spouts ...	.....	.....	.....	.....
(b) W. N. Cocks ...	4	.....	.....	.....
(c) Bibcocks ...	.....	.....	19	.....
(d) Pushcocks ...	4	64	1	.....
(e) Other types ...	1	.....	.....	.....

No. 6—*contd.*

Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.	Thana.
.....	54,000 gallons per hour × 24 = 1,296,000	.....	.....	.....	.....
.....	2	.....	.....	.....	.....
.....	123' × 56' × 6' each	.....	.....	.....	.....
.....	500,000	.....	.....	.....	.....
1 in 2 compartments.	Two	.....	1 in 3 compartments.	1	.....
60' × 32' × 10' each.	120' × 112' × 6' 120' × 120' × 12'	.....	48' × 34' × 6·25' each.	100' × 100' × 7'	.....
.....	.....	.....	Top	.....	.....
360,000 combined.	H.S.R. 6' L.S.R. 12' H.S.R. 500,000 L.S.R. 1,000,000	.....	.....	437,500	.....
.....	.....	.....	8 Public cisterns only.	.....	.....
.....	.....	.....	.....	.....	.....
.....	333	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
118	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	54	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
82	.....	.....	.....	.....	.....

STATEMENT

Particulars.	Ahmedabad.	Kapadwanj.	Surat.
Three taps—			
(*a*) Cast iron spouts ...	.....	.....	.....
(*b*) W. N. Cocks ...	10	7	.....
(*c*) Bibcocks ...	.....	.....	.....
(*d*) Pushcocks ...	20	10	.....
(*e*) Other types ...	.....	.....	.....
Four taps—			
(*a*) Cast iron spouts ...	.....	.....	.....
(*b*) W. N. Cocks ...	2	.....	.....
(*c*) Bibcocks ...	5	.....	.....
(*d*) Pushcocks ...	.....	9	.....
(*e*) Other types ...	.....	.....	.....
Wall fountains	.....	.....	.....
Total ...	357	34	169
22. Number of fire hydrants ...	510	49	456
23. Number of road watering posts or standposts.	704	113	.....
24. Number of cattle troughs ...	65	8	19

No. 6—*contd.*

Bhiwandi.	Kurla.	Ahmednagar.	Jalgaon.	Dhulia.
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	6	.....	18
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	46	8	.....
.....	.....	.....	.....	.....
.....	14	149	183	21
5	99	89	66	71
.....	.....	10	2	.....
.....	1	16	5	9

STATEMENT

Particulars.	Nandurbar.	Nusik.	Trimbak.	Poona City.
Three taps—				
(a) Cast iron spouts.	.....	.....	.....	.....
(b) W. N. Cocks ...	.....	.....	.....	.....
(c) Bibcocks ...	.....	.....	.....	.....
(d) Pushcocks ...	.....	.....	.....	.....
(e) Other types ...	.....	.....	.....	.....
Four taps—				
(a) Cast iron spouts.	.....	.....	.....	.....
(b) W. N. Cocks ...	.....	.....	.....	.....
(c) Bibcocks ...	3	15	.....	.....
(d) Pushcocks ...	.....	.....	.....	.....
(e) Other types ...	.....	.....	.....	.....
Wall fountains ...	.....	.....	.....	.....
Total ...	60	152	.....	.....
22. Number of fire hydrants.	61	55	.....	.....
23. Number of road watering posts or standposts.	.....	.....	.....	.....
24. Number of cattle troughs.	6	4	.....	.....

No. 6—*contd.*

Poona Cantonment.	Kirkee.	Lonavla.	Alandi.	Karad.
.....	.....	.....	.....	.....
.....	.....	.....	.....	1
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	4	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	1
.....	.....	34	4	83
447	105	22	.....	38
11	.....	4	.....	.....
4	.....	2	1	1

STATEMENT

Particulars.	Satara City.	Sholapur.	Barsi.	Pandharpur.
Three taps—				
(a) Cast iron spouts ...	.....	.....	.....	.....
(b) W. N. Cocks ...	.....	.....	.....	.....
(c) Bibcocks ...	.....	.....	1	.....
(d) Pushcocks ...	.....	3	.....	.....
(e) Other types ...	.....	.....	.....	.....
Four taps—				
(a) Cast iron spouts ...	.....	.....	.....	.....
(b) W. N. Cocks ...	.....	.....	.....	.....
(c) Bibcocks ...	.....	.....	.....	.....
(d) Pushcocks ...	.....	1	.....	.....
(e) Other types ...	.....	.....	.....	.....
Wall fountains... ...	.....	.....	.....	.....
Total ...	131	329	105	.....
22. Number of fire hydrants ...	.....	162	16	.....
23. Number of road watering posts or standposts.	10	.....	15	.....
24. Number of cattle troughs ...	7	29	17	.....

No. 6—*contd.*

Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.	Thana.
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.04	399	.....	.....	.....	.....
62	108	.....	.....	.....	.....
2	.....	.....	.....	.....	.....
18	5	.....	.....	.....	.....

N. K. JOGLEKAR,

Consulting Public Health Engineer to Government.

STATEMENT No. 7.

Detailed estimate of expenditure incurred on Public Health Works during the year 1937-38.

Serial No.	Name of Place.	Water Works Original and Special Repairs.	Water Works Maintenance.	Drainage Works.	Other Works.	Total.	Remarks.
1	2	3	4	5	6	7	8
		Rs.	Rs.	Rs.	Rs.	Rs.	
1	Ahmedabad ...	2,21,285	2,79,565	2,51,480	...	7,52,330	
2	Kapadwanj ...	8,052	12,688	...	...	20,740	
3	Surat ...	.....	70,737	...	...	70,737	
4	Thana ...	2,603	3,516	2,250	...	8,379	
5	Kurla ...	.....	4,567	16,446	...	21,013	
6	Ahmednagar ...	1,599	8,212	2,993	5,661	18,465	
7	Jalgaon ...	1,25,549	27,410	682	...	1,53,641	
8	Dhulia ...	2,815	7,035	5,303	...	15,153	
9	Nandurbar ...	11,623	5,375	4,140	...	21,138	
10	Nasik ...	6,927	38,245	...	...	45,172	
11	Trimbak ...	.....	.....	...	...	.....	
12	Poona City ...	.....	.....	...	...	.....	
13	Poona Cantonment ...	36,914	1,66,424	...	...	2,03,338	
14	Kirkee ...	.....	63,890	...	...	63,890	
15	Lonavla ...	546	2,990	...	...	3,536	
16	Alandi ...	.....	5,454	...	...	5,454	
17	Karad ...	.....	9,000	...	...	9,000	
18	Satara Camp ...	.....	5,000	...	..	5,000	
19	Sholapur ...	39,473	1,77,116	37,094	...	2,53,682	
20	Barsi ...	.....	13,504	267	...	13,771	
21	Pandharpur ...	.....	17,435	...	...	17,435	
23	Bijapur ...	44,222	31,929	90	2,036	78,277	
23	Hubli ...	5,016	53,768	18,327	...	77,111	
24	Matheran ...	.....	.....	...	...	.....	
25	Nipani ...	917	5,607	756	...	7,280	
26	Ratnagiri ...	2,480	3,198	...	...	5,628	
	Total ...	5,09,970	10,12,665	3,39,838	7,697	18,70,170	

N. K. JOGLEKAR,

Consulting Public Health Engineer to Government.

STATEMENT No. 8.

STATEMENT

Comparative statement of fuel consumption, working expenses and the year

Serial No.	Name of Water Works.	Class of work, Gravitation or Pumping.	Fuel consumed.	Fuel consumption per 1,000 feet gallons.	Price of fuel per Ton.	Total average lift.
1	2	3	4	5	6	7
				Lb.		
1	Ahmedabad ...	Pumping ...	.....	.....	.....	110
2	Kapadwanj ...	Do. ...	207	0·004	80·0	146
3	Surat ...	Do. ...	1,355	.....	18·06	113·84
4	Thana ...	.....	.....	.....	.....	.....
5	Kurla ...	.....	.....	.....	.....	80
6	Ahmednagar ...	.....	.....	.....	.....	.....
7	Jálgaon ...	Pumping ...	.....	.....	0·13	186
8	Dhulia ...	.....	.....	.....	.....	.....
9	Nandurbar ...	Pumping ..	1,000 Gls.	·0007	79·75	90 50
10	Nasik ..	Do. ...	1,314	·044	13·5	200
11	Trimbak ...	.....	.....	.....	.....	.....
12	Poona City ...	.....	.....	.....	.....	.....
13	Poona Cantonment ...	Gravitation and Pumping.	1,358 Tons coal	.....	19	75 to 80 and 180 to 210
14	Kirkee ...	.....	15,114 Gls. oil.	.....	63	170
15	Lonavla ...	Gravitation ...	.....	.....	.....	.....
16	Alandi ...	Pumping ...	3	.....	64	90
17	Karad ...	Do. ...	14	·0030	88	145
18	Satara Camp ...	Gravitation ...	.....	.....	.....	.....
19	Sholapur ...	Gravitation and Pumping.	392·77	·031 Pies.	98	145
20	Barsi ...	.....	.....	.....	.....	.....
21	Pandharpur ...	Pumping ..	44·19 Tons.	8,028 Gls.	102	137
22	Bijapur ...	Do. ...	945	·044 Lbs.	15·88	221
23	Hubli ...	Do. ...	991·5 Tons.	·05 ,,	14·63	139
24	Matheran ...	.....	.....	.....	.....	.....
25	Nipani ...	Pumping ..	3,480 Gls.	.....	.....	.....
26	Ratnagiri ...	Gravitation ...	.....	.....	.....	.....

No. 8.

receipts of various water works in the Bombay Province during 1937-1938.

Percentage charges for—					Per 1,000 gallons.		Per head per annum.			
Establishment.	Fuel.	Oil and Waste.	Repairs to Machinery.	Other charges.	Total working cost.	Total receipt.	Total working cost.	Total receipt.	Total profit or loss.	Remarks.
8	9	10	11	12	13	14	15	16	17	18
					Rs. As.		As.	As.	As.	
20	25	·2	·1	54·7	1 anna	4·3	12	3·9	2·15	
33·8	12·1	4·6	2·0	23·3	0 2 6	0 5 3	1 0 9	1 7 9	6,911 6 4	
26·5	56·63	3·2	8·72	4·8	6·6 pies	5·5	0 4 7	1 8 0	196,800	Profit.
...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	
5	...	...	...	...	0·65	0·15	0·79	1·81	1·02	
...	...	...	...	...	...	...	...	...	...	
47	30	16	...	6	0 1 6	...	0 0 8	...	...	64,000 Gls. pumped daily.
53	31	11	...	4	0 0 7	...	0 0 6	...	...	1,28,000 Gls. pumped daily.
31	60	1·4	7·2	·4	1·8 As.	3 7	12·2	24·7	22,335	
...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	
8,880	25·847	286·9	1537	...	5·51 As	7·25	6 6 0	8 8 0	2·2	Profit.
5,913	3·698	897	1225	...	9.46 ,,	4·48	10 14 0	9 13 0	1·1	Loss.
...	...	...	...	...	0 1 1	...	...	...	16,084	Profit.
31·10	3·5	4·5	1·2	59·70	...	...	...	...	...	
35·93	13·88	5·38	15·38	29·43	3·83 As.	5·15	1·218	1·69	0·472	Profit.
No pumping					0 4 2	0 6 6	2 2 9	2 15 7	0 12 10	Do.
13·13	20·22	1·97	·37	64·32	2·11 As.	2·03	1·22	Rs. 1·93	Rs. 0·71	
...	...	.....	...	...	...	...	...	...	...	
38·5	25·9	8·6	4·4	22·6	1 anna	2·64	0·58	Rs. 1·55	Rs. 0·97	Profit.
24·1	48·8	4·6	4·2	18·3	2·5 As.	3·6	...	...	...	
28·7	27	·84	...	...	290 ,,	4·54	10·30	16·1	1·64 / 5·8	Profit per 100 Gls. / Profit P. H.
...	...	...	...	...	...	...	...	...	...	
54·25	...	39·21	6·34		2·49	4·43	5·02	8·93	3·91	Profit.
...	...	...	...	...	...	...	...	...	...	

N. K. JOGLEKAR,
Consulting Public Health Engineer to Government.

STATEMENT

Statement showing Capital cost, details of income and expenditure

Serial No.	Particulars.		Ahmedabad.	Kapadwanj.	Surat.	Thana.
1	Description of Plant ...	.....	.....	Two Pumping Engines, Oil Engine and Deep Well Pump.	Two Sets of Worthington Pumps with 3 sets of B & W Boilers.	.....
2	Initial Capital cost in rupees.	Rupees ...	22,00,000	4,79,384	9,88,319	.....
3	Total cost of works in rupees	Do. ...	50,53,582	4,87,436	12,79,789	.....
4	Number of inhabitants drawing their supply from mains.	.....	3,70,000	15,931	1,61,413	.....
5	Hours of daily supply ...	Hours ...	13·5	11	17	.....
6	Quantity supplied during the year in million gallons.	Gallons ...	5,712	78·88	1331·81	.....
7	Total W. H. P. hours per annum in millions.	.....	3·23	0·59	45·94	.....
8	Maximum daily average during any one month in million gallons.	Gallons ...	16·59	0·28	4·14	.....
9	Average daily supply for the year in million gallons.	Do. ...	15·65	0·21	3·64	.....
10	Maximum supply per head per day in gallons.	Do. ...	45·0	21·8	29·9	.....
11	Average supply per head per day in gallons.	Do. ...	43·0	13·22	22·6	.....
12	Total lift (average) feet ...	Feet ...	110·0	146·0	113·84	.....
13	Fuel consumed ..	Tons ...	.....	20·7	1,355	.....
14	Fuel consumption per million feet gallons.	Lbs. ...	5·2	41·0	20·02	.....
15	Cost of fuel per ton ...	Rupees ...	14·5	80·0	18·06	.....
16	Cost of establishment per million feet gallons.	Annas ...	1·80	7·83	1·28	.....
17	Cost of fuel or electric energy per million feet gallons.	Do. ...	2·24	2·75	2·75	.....
18	Cost of oil and waste per million feet gallons.	Do. ...	0·25	1·0	0·16	.....
19	Cost of repairs to machinery per million feet gallons.	Do. ..	0·10	0·50	0·42	.....
20	Cost of other charges per million feet gallons.	Do. ...	5·01	5·42	0·23	.....
21	Total charges per million feet gallons.	Do. .	9·5	17·50	4·85	.....

No. 9.

of water works in the Bombay Province during the year 1937-38.

Kurla.	Ahmed-nagar.	Jalgaon.	Dhulia.	Nandur-bar.	Nasik.	Trimbak.	Poona City.
.....	.....	.....	.....	Gravitation Scheme	Worthington Simpson Pumps and Babcock Wilcox Boilers.	.....	.....
1·08 lakhs	18,63,785	4,08,564	5,01,558	3,75,051	5,50,000		
1·13 lakhs	18,65,384	5,53,437	5,04,373	3,85,996	7,44,759		
32,000	43,580	34,464	38,276	16,741	50,000		
24	6	5	10	4	4		
201·85	260·97	421·22	146	92·67	337·66		
.....	.....	0·39	.....	.....	2·8		
0·57	0·99	1·23	0·4	0·3	1·03		
0·55	0·75	1·15	0·4	0·25	0·92		
17·5	.....	35	14	23	21·6		
17·2	17·07	33·40	10	14·9	18·4		
80	.....	186	.....	90 and 50	200		
.....	.....	M.U. 1777·22	.....	1,000 gls.	1,314		
.....	.....	M.U. 4	.....	1·4	43·5		
.....	.....	0·13	.....	79·75	13·6		
.....	.....	.....	.....	14·0	1·9		
.....	.....	.....	.....	8·5	3·6		
.....	.....	.....	.....	3·5	0·07		
.....	.....	.....	.....	1·5	0·4		
.....	.....	.....	.....	.....	0·08		
.....	.....	.....	.....	27·5	6·0		

Information not supplied.

STATEMENT

Statement showing Capital cost, details of income and expenditure

Serial No.	Particulars.		Poona Cantonment.	Kirkee.	Lonavla.	Alandi.
1	Description of Plant	.....	.....	.....	Gravitation system.	Two Oil Engines driving 2 3" Centrifugal Pumps.
2	Initial capital cost in Rupees	Rupees ...	6·90 lakhs	4 lakhs	4,93,414	86,253
3	Total cost of works in Rupees	Do. ...	14,78,871	8,00,442	5,27,367	.....
4	Number of inhabitants drawing their supply from mains.	.....	53,183	13,062	10,693	1,684
5	Hours of daily supply	Hours ...	24	24	24 and 8	24
6	Quantity supplied during the year in million gallons.	Gallons ...	993·69	241·07	61·31	7·86
7	Total W. H. P. hours per annum in millions.	.....	0·60	0·175	.....	0·003
8	Maximum daily average during any one month in million gallons.	Gallons ...	3·23	0·80	0·34	0·04
9	Average daily supply for the year in millon gallons.	Do. ...	2·72	0·66	0·17	0·003
10	Maximum supply per head per day in gallons.	Do. ...	61	61	30 (approx.)	.....
11	Average supply per head per day in gallons.	Do. ...	51	50	15	15
12	Total lift (average) feet	Feet ...	75 to 80 & 180 to 210	170	.....	90
13	Fuel consumed	Tons ...	1,358	15,114 gls.	.....	3
14	Fuel consumption per million feet gallons ...	Lbs. ...	1,93,769·5	40,982	.....	9·8
15	Cost of fuel or per ton	Rupees ...	19	63	.....	64
16	Cost of establishment per million feet gallons.	Annas ...	2·3	3·8	.....	36·8
17	Cost of fuel or electric energy per million feet gallons.	Do. ...	2·3	1·8	.....	4·3
18	Cost of oil and waste per million feet gallons.	Do. ...	0 71	0·92	.....	5·5
19	Cost of repairs to machinery per million feet gallons.	Do. ...	0·5	2·16	.....	0·15
20	Cost of other charges per million feet gallons.	Do. ...	7·9	16·3	.....	72·00
21	Total charges per million feet gallons ...	Do. ...	13·71	24·98	.....	118·75

No. 9.

of water works in the Bombay Province during the year 1937-38.

Karad.	Satara Camp.	Sholapur.	Barsi.	Pandharpur.	Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.
Two sets of Pumps and Engines and a meter.	Slow Sand Filters with Gravitation Distribution.	3 Engines with two stage centrifugal Pumps.	Two Service Reservoirs and one Chloronome Plant.	Two Sets of Worthington Triplex Pumps driven by 2 oil engines.	Babcock Water Tube Boilers and Horizontal Triple Expansion Engines with 2 Pumps.	Babcock and Wilcox water Tube Boilers on Worthington Triple Expansion with Worthington Pumps.	.....	2 Engines of 11 H. P. 1 Engine of 6 H. P.	Gravitation Scheme.
2,44,000	83,417	22,55,451	5,51,421	4,30,871	6,22,060	5,01,924		7,000	1,07,827
2,55,000	83,417	22,94,923	5,51,421	6,78,978	6,66,282	15,25,188		9,031	1,07,827
14,500	2,300	1,35,574	27,610	30,000	.....	83,494		17,857	.....
5	22	8	6·5	6·5	5	15		12	24 and Partial.
73·76	16·84	1,525·63	194·33	282·02	208·86	296·04		36·0	57·27
0·054	No pumping.	1·11	...	0·20	·002	0·21		.....	.....
0·21	0·05	4·34	0·57	1·06	0·60	0·87		0·12	0·28
0·20	0·05	4·17	0·53	0·77	0·57	0·81		0·10	0·16
19	22	32·01	20·80	54·33	.....	.....		5·5	24·36
14	20	30·15	19·27	25·76	17·07	10		5·5	18·42
145	No pumping.	145	...	137	221	139		.....	.....
14	Do. ...	392.77	...	44·19	945	991·5		.....	.....
3·03	No Electricity.	4·26	...	2·70	44	54		.....	.....
88	.....	98	...	102	15·88	14·63		.....	.....
5·01	No pumping.	1·68	...	2·80	2·4	6		.....	.....
1·93	No Electric Energy.	2·31	...	1·90	.....	5·64		.....	.....
0·75		0·23	...	0·63	0·4	0·17		.....	.....
2·10	No pumping.	0·04	...	0·32	0·4	.....		.....	.....
4·10		8·23	...	2·10	.....	.....		.....	.....
13·89	...	12·49	...	7·75	.....	20·8		.....	.....

STATEMENT

rial o.	Particulars.		Ahmed-abad.	Kapad-wanj.	Surat.	Thana.
22	Maintenance charges per thousand gallons supplied.	Annas ...	0·8	3·33	0·55	.....
23	Interest and sinking fund charges per thousand gallons supplied.	Do. ...	0·2	.....	.....	.....
24	Total (Maintenance and Interest and sinking fund) per thousand gallons supplied.	Do. ...	1·0	3·33	0·55	.....
25	Maintenance charges in thousands.	Rupees ...	279·5	12·60	70·74	.....
26	Interest and sinking fund charges in thousands.	Do. ...	89·7	1·0	.....	.....
27	Total income in thousands ...	Do. ...	1,445·7	23·6	244·4	.....
28	Profit or loss on Maintenance in thousands (27-25).	Do. ...	1,166·2	10·91	173·66	.....
29	Profit or loss on Maintenance and Interest and sinking fund in thousands.	Do. ...	1,075	.....	.....	.....
30	Capital expenditure from Revenue in thousands.	Do. ...	221	16·69	.....	.....
31	Net Profit or Loss in thousands.	Do. ...	854	6·91	196·8	.....
32	Profit or Loss in percentage on total cost of works.	Do. ...	17 %	1·4 %	15·4 %	.....

No. 9—*contd.*

Kaira.	Ahmednagar.	Jalgaon.	Dhulia.	Nandurbar.	Nasik.	Trimbak.	Poona City.
0·31	.....	0·02	9·4	0·91	0·9	Information not supplied.	.....
0·12	.....	.....	.....	1·0	0·2		.....
0·43	.....	0·93	9·4	1·91	1·1		.....
4·67	8·2	27·41	7·0	5·38	38·25		.....
1·73	51·0	3·29	.....	24·0	8·67		.....
133·48	50·6	62·68	27·68	29·08	70·99		.....
123·91	42·4	35·27	21·68	23·70	32·74		.....
3·32	.....	.....	.....	0·41	30·3		.....
.....	.....	.....	.....	5·97	6·93		.....
3·32	.....	.....	.....	15·62	22·34		.....
2·9 %	.....	.....	4·1 %	.....	41 %		.....

STATEMENT

Serial No.	Particulars.		Poona Cantonment.	Kirkee.	Bonavla.	Alandi.
22	Maintenance charges per thousand gallons supplied.	Annas ...	2·68	4·24	0·75	11·10
23	Interest and sinking fund charges per thousand gallons supplied.	Do. ...	2·83	5·22	0·33	2·60
24	Total (Maintenance and Interest and sinking fund) per thousand gallons supplied.	Do. ...	5·51	9·46	1·08	13·70
25	Maintenance charges in thousands ...	Rupees ...	166·42	63·89	2·99	5·45
26	Interest and sinking fund charges in thousands.	Do. ...	175·67	78·72	1·63	1·31
27	Total income in thousands	Do. ...	450·36	127·85	20·7	.....
28	Profit or loss on Maintenance in thousands. (27-25).	Do. ...	283·91	63·96	17·71	.....
29	Profit or loss on Maintenance and Interest and sinking fund in thousands.	Do. ...	108·26	−14·76	.....	.....
30	Capital expenditure from Revenue in thousands.	Do. ...	.....	.....	.....	.....
31	Net Profit or Loss in thousands	Do. ...	108·26	−14·76	16·08	.....
32	Profit or Loss in percentage on total cost of works.	Do. ...	7·32 %	−1·84 %	4·27 %	.....

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Karad.	Satara Camp.	Sholapur.	Barsi.	Pandharpur.	Bijapur.	Hubli.	Matheran.	Nipani.	Ratnagiri.
1·95	4·75	1·45	1·1	1·0	2·5	2·00		2·49	0·68
1·87	.....	0·17	...	2·14	1·5	0·53		.....	1·76
3·82	4·75	1·62	1·1	3·14	4	3·43		2·49	2·44
9·0	5·00	177·12	13·50	17·44	39·21	53·77		5·61	3·2
8·67	.....	24·15	17·29	37·88	19·28	9·88		.....	6·30
22·3	6·7	280·15	22·96	46·43	31·54	84·14		9·97	8·1
13·3	1·7	103·03	15·46	28·00	−1·67	30·37		4·36	4·9
6·90	.....	78·88	+1·8	−8·88	13·1	20·48		.....	−0·64
230·44	83·42	39·47	...	.....	.....	5·06		.....	.....
6·90	1·70	78·88	+1·8	−8·88	.....	15·46		3·44	−0·64
3·7 %	.....	3·4 %	...	−1·3 %	.....	56·5 %		.....	.....

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